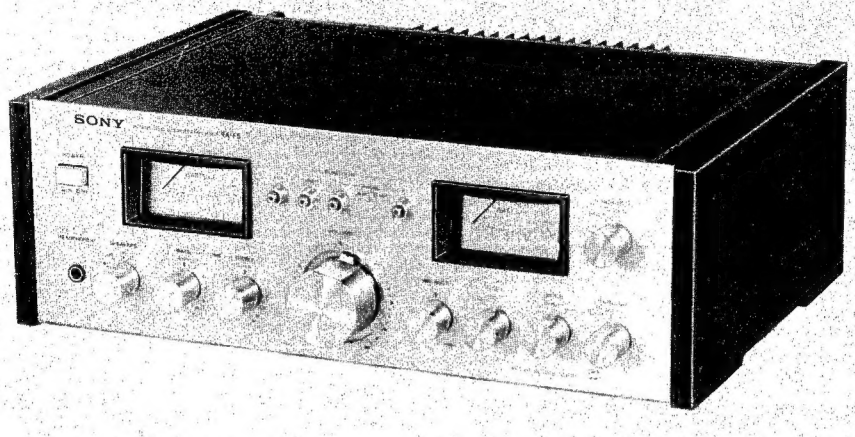
TA-F5

Canadian Model



INTEGRATED STEREO AMPLIFIER

SPECIFICATIONS

GENERAL

Power Requirements: 120 V ac, 60 Hz

Power Consumption: 320 VA

AC Outlets: 2 switched 100 watts
1 unswitched 50 watts

Dimensions: Approx. 435 (w) x 145 (h) 370 (d) mm
17⅛ (w) x 5¾ (h) x 14⅝ (d) inches
including projecting parts and controls

Weight: Approx. 8.2 kg, 18 lb 1 oz (net)
Approx. 10 kg, 22 lb 1 oz
(in shipping carton)

AMPLIFIER SECTION

Harmonic Distortion: Less than 0.04 % at rated output
Less than 0.02 % at 10 W output

IM Distortion: (60 Hz : 7 kHz = 4 : 1)
Less than 0.01 % at rated output
Less than 0.008 % at 10 W output

Frequency Response: PHONO 1, 2 RIAA equalization curve ±0.2 dB

TUNER, AUX, TAPE 1, TAPE 2: 3 — 70,000 Hz $^{+0}_{-1}$ dB

Damping Factor: 40 (8 Ω, 1 kHz)

Residual Noise: Less than 50 μV (8 Ω, Network A)

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND ⚠ MARK ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ !

LES COMPOSANTS IDENTIFIÉS PAR UN TRAMÉ ET UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DES SUPPLÉMENTS PUBLIÉS PAR SONY.

— Continued on next page —

SONY®

SERVICE MANUAL

Inputs:

		Sensitivity	Impedance	Maximum Input Level (0.1 % distortion)	S/N (weighting network, input level)
PHONO 1, 2	MC	0.25 mV	100 Ω	25 mV	70 dB (A, 0.25 mV)
	MM	2.5 mV	50 kΩ	250 mV	85 dB (A, 2.5 mV)
TUNER AUX TAPE 1, 2		150 mV	50 kΩ	———	100 dB (A, 150 mV)

Outputs:

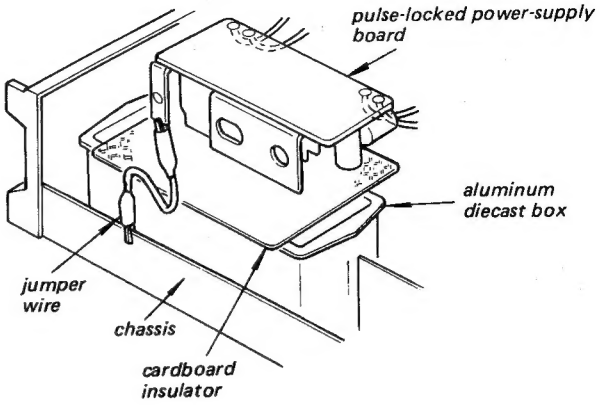
	Voltage	Impedance
REC OUT 1, 2	150 mV	4.7 kΩ
HEADPHONES	Accepts low and high impedance headphones.	
SPEAKERS	Accepts speakers of 4 – 16 Ω.	

Tone Controls: BASS
±10 dB at 60 Hz (TURNOVER FREQ 300 Hz)
TREBLE
±10 dB at 25 kHz (TURNOVER FREQ 5 kHz)

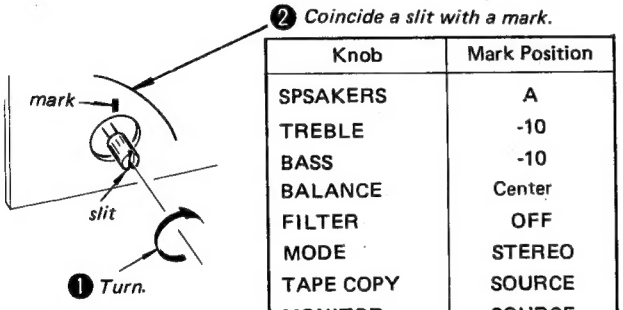
Filters: LOW
6 dB/oct. below 15 Hz
HIGH
6 dB/oct. above 9 kHz

SERVICING NOTE

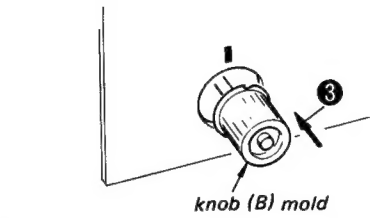
1. This set has a pulse-locked power-supply circuit which is quite different from a conventional power-supply circuit. The pulse-locked power supply directly rectifies and smooths the ac input power to produce the higher dc voltages required in the power supply circuit. When servicing this set, note the following.
   a) To prevent unwanted radiation due to pulse signals in the pulse-locked power-supply circuit, the pulse-locked power-supply board is shielded by the aluminum diecast box.
   b) The negative circuit of the secondary rectifier in the pulse-locked power-supply circuit is grounded by screws in the aluminum diecast box. When checking the pulse-locked power-supply board out of the box, use a jumper wire and a cardboard insulator as shown on the right.

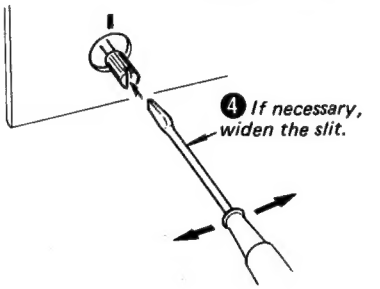


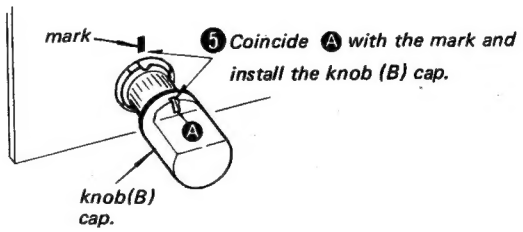
2. When replacing a knob (SPEAKERS/TREBLE/ BASS / BALANCE / FILTER / MODE / TAPE COPY / MONITOR), prepare a knob (B) cap (4-854-266-00) and a knob (B) mold (4-854-267-00). Installation of the knob is as follows.



Knob	Mark Position
SPSAKERS	A
TREBLE	-10
BASS	-10
BALANCE	Center
FILTER	OFF
MODE	STEREO
TAPE COPY	SOURCE
MONITOR	SOURCE







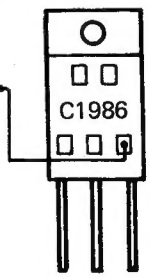
Part No.	*Description*
X-4854-213-1	Knob Ass'y
including;	
4-854-266-00	Cap, knob (B)
4-854-267-00	Mold, knob (B)

3. CAUTION

When replacing Q503 – Q506 in the pulse-locked power-supply circuit, use those which have the same hFE values.

Q503-506 8-729-308-62 2SC1986C-O--O

Note: O indicates the hFE value.



SECTION 1
OUTLINE

1-1 CIRCUIT DESCRIPTION

In the power supply section of conventional audio equipment, ac input power is usually changed in voltage by a transformer and rectified to obtain a dc voltage. The disadvantages of this are as follows;

1. Voltage regulation is poor.
2. Hum in the output results if large filter are not used.
3. High-power output can not be obtained without a very large transformer.

To eliminate these problems, the pulse-locked power supply is used in this set. In the power supply, after a dc voltage is obtained by rectifying the ac input power, a 20 kHz pulse signal is generated in the inverter. The pulse signal is converted to the desired-voltage signal by a high-frequency transformer which has a small ferrite-core, and then rectified to produce dc voltages.

Fig. 1 shows the block diagram of the pulse-locked power supply. This power supply has the following advantages;

1. The source impedance can be made smaller so better voltage regulation (less than 7%) can be obtained.
2. Square waves as high in frequency as 20 kHz are used, so hum does not occur.
3. Efficiency is very high, since the dc resistance of the high-frequency transformer is small and a high-efficiency inverter is used.
4. This power supply consists of small components that result in a very small size and a light weight. This power supply is half the size and less than one quarter the weight of a conventional power supply.

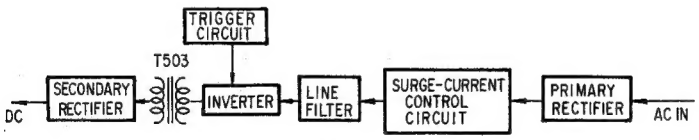


Fig. 1

1. SURGE-CURRENT CONTROL CIRCUIT (See Fig. 2)

Since the pulse-locked power supply directly rectifies ac power input, if S6 (POWER) is set to ON without a surge-current control circuit, a large surge-current charging C313 will flow and damage S6 (POWER).

To prevent this, the parallel combination of R337 to R339 are added in series with S6 (POWER) to control the rush-current. The resistors are shorted by RY302 after dc voltage appears in the secondary rectifier circuit.

2. LINE FILTER (See Fig. 2)

To eliminate the high-frequency ripple component produced in the inverter, a line filter is installed. The line filter consists of C501 to C503. L501 is a bifilar RF choke having a ferrite toroidal core.

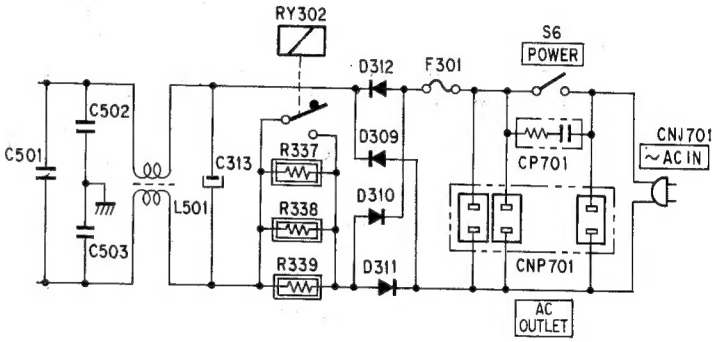


Fig. 2

3. INVERTER TRIGGER CIRCUIT (See Fig. 3.)

Setting S6 (POWER) to ON is not sufficient to start the inverter oscillating; a trigger signal is also required for inverter oscillation. The operation is as follows;

1) When S6 (POWER) is set to ON, current ① charges C506.
2) When the voltage between the base and emitter of Q502 becomes more than 0.6 V, Q502 and Q501 turn on.
3) C506 discharges and current ② flows, causing the inverter to start to oscillate.
4) After the start of the oscillation, the voltage appearing at the winding N2 of T503 is rectified by D501 and D502 and charges C505. As a result, Q502 and Q501 turn off so that the load on the N1 winding of T501 is reduced and the inverter operates normally, maintaining oscillation.

4. INVERTER CIRCUIT

The inverter consists of four transistors and generates a square-wave signal of about 20 kHz.

Fig. 4. shows the principle of the inverter. By turning S1 and S4, or S2 and S3 on and off, the square-wave signal shown in Fig. 5 is generated at the secondary side of T503. In short, dc current is changed to a square-wave signal by switching action.

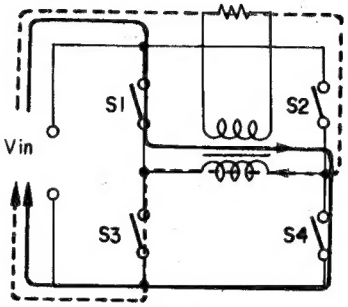


Fig. 4

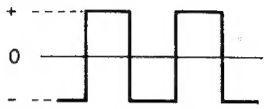
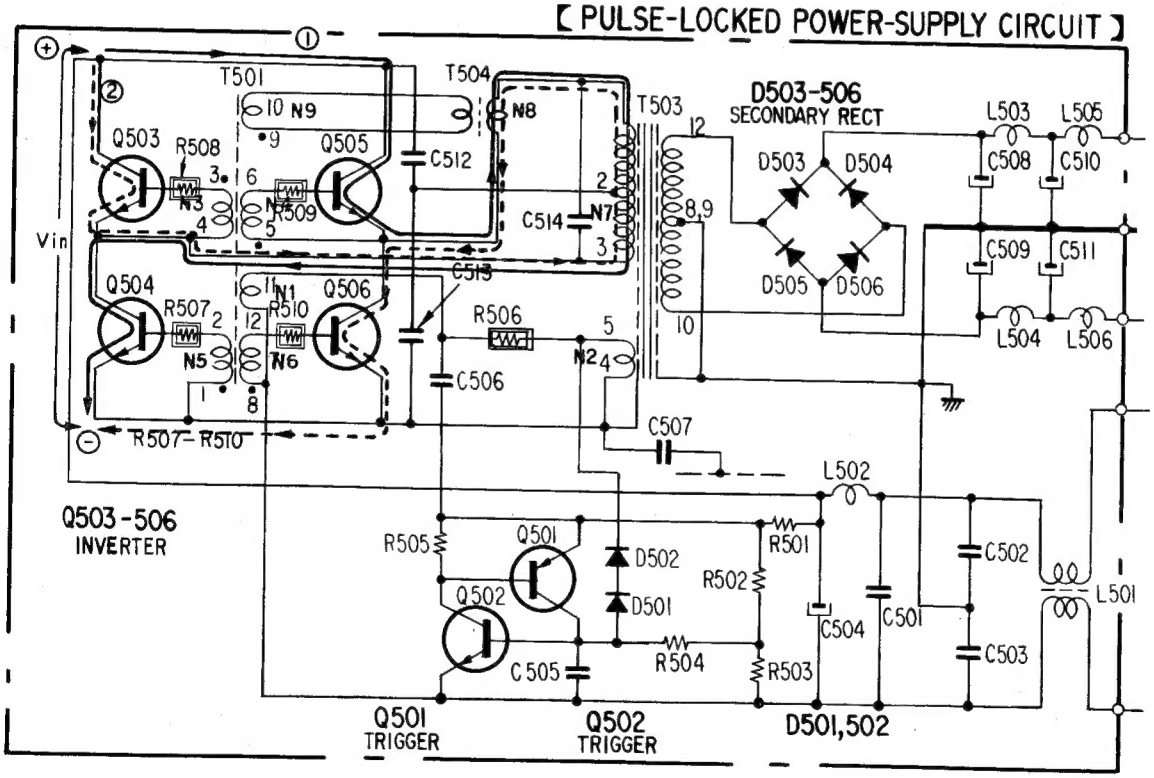


Fig. 5



N3 and N6 are wound in the same direction as N1. N4, N5 and N9 are wound in the opposite direction of N1.

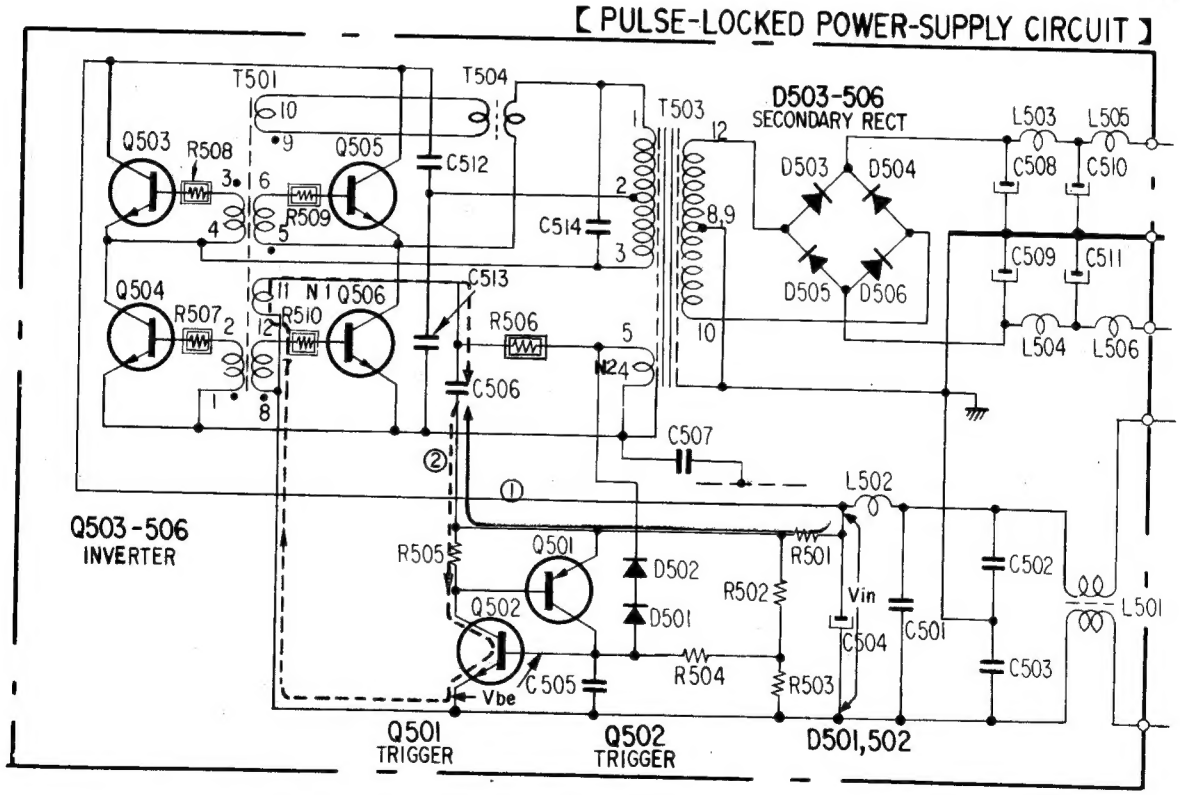
Fig. 3

The details are as follows (See Fig. 6.);

1) A trigger signal is generated at winding N1 by the trigger circuit.
2) We assume that Q504 and Q505 are turned on by current ① which is induced by the trigger signal.
3) At this time, an induced current flows through winding N9 and generates voltages at windings N4 and N5. These voltages keep Q504 and Q505 on. This is a current feedback.
4) At the same time, an induced current flows through winding N2 of T503 and generates voltages at windings N4 and N5. These voltages also keep Q504 and Q505 on. This is a voltage feedback.
5) The current and voltage feedbacks keep Q504 and Q505 on and send power to T503. After a while, T501 becomes saturated and stops generating the voltages that keep Q504 and Q505 on.
6) Q504 and Q505 then turn off, and a voltage which is opposite in polarity to the former voltage appears at winding N2.
7) This voltage induces current ② , and turns Q503 and Q506 on.
8) After a while, Q503 and Q506 turn off and Q504 and Q505 turn on, again.
9) In this way, a square-wave signal is obtained at the secondary side of T503.

5. SECONDARY RECTIFIER

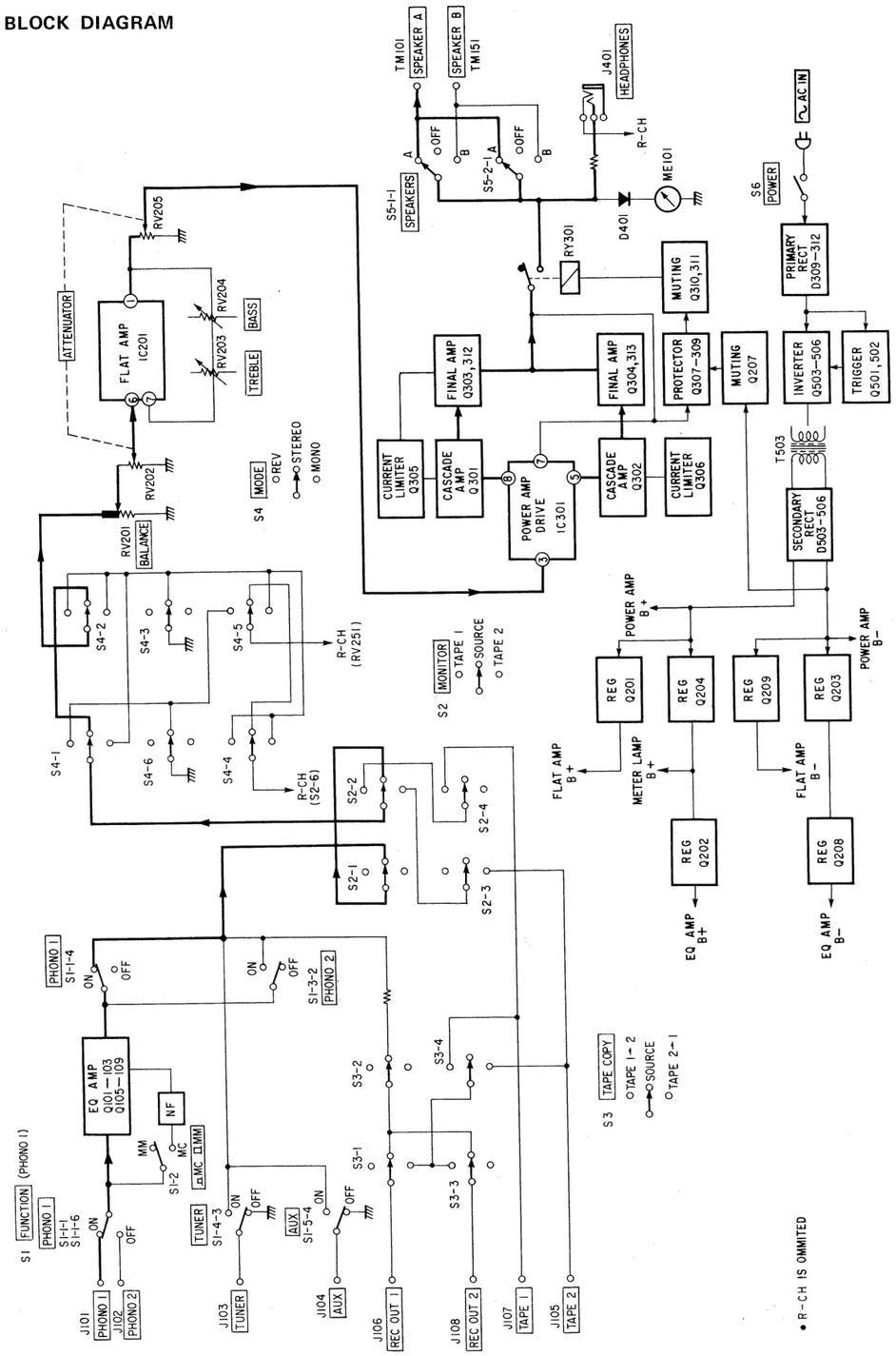
The secondary rectifier converts the square-wave into dc. This consists of D503 to D506, L503 to L506 and C508 to C511. S34-type diodes (high-speed switching diodes) are used to reduce power loss.



N3 and N6 are wound in the same direction as N1.
N4, N5 and N9 are wound in the opposite direction of N1.

Fig. 6

1-2. BLOCK DIAGRAM



SECTION 2

DISASSEMBLY

- Follow the disassembly procedure in the numerical order given.

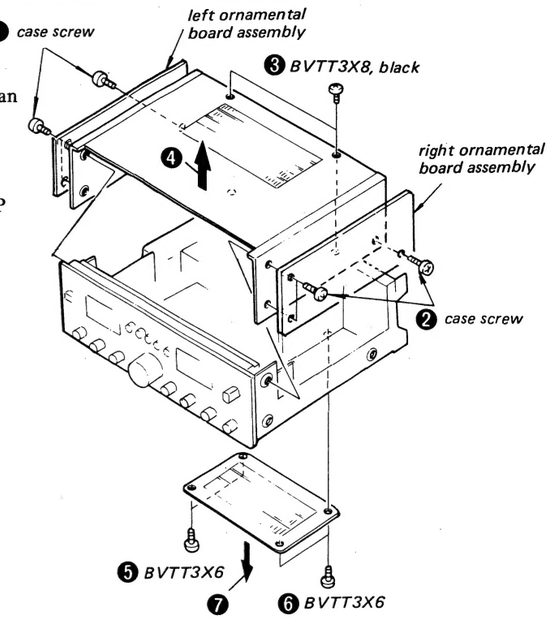
【CASE AND BOTTOM PLATE REMOVAL】

Case: ❶ to ❹

The component side of the EQ AMP board can be checked.

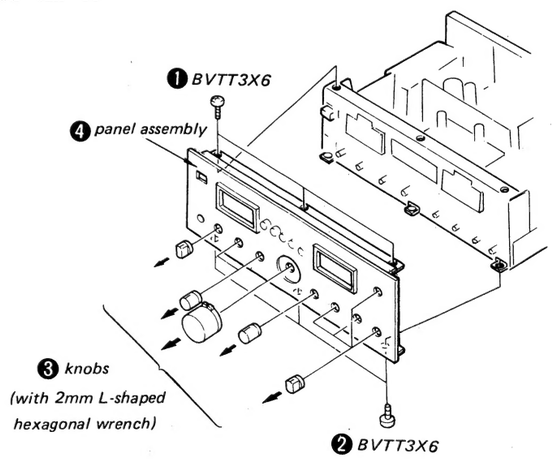
Bottom Plate: ❺ to ❼

The conductor side of the POWER AMP board can be checked.



【PANEL ASSEMBLY REMOVAL】

After removing the panel assembly, the S6 (POWER), EQ AMP board and FLAT AMP board can be removed.



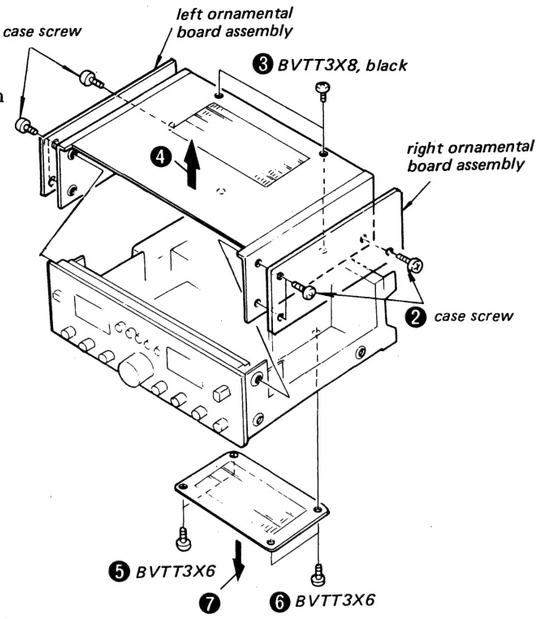
SECTION 2
DISASSEMBLY

- Follow the disassembly procedure in the numerical order given.

[CASE AND BOTTOM PLATE REMOVAL]

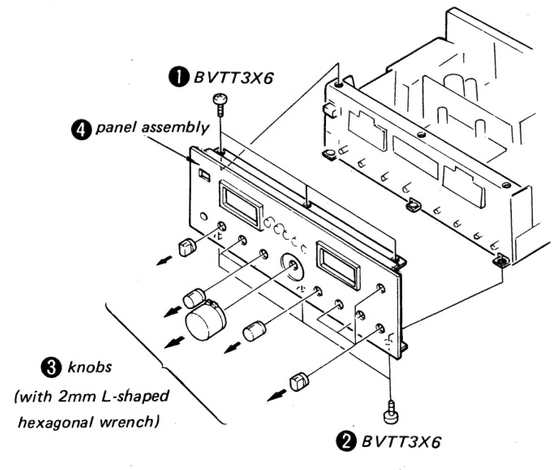
Case: ❶ to ❹
The component side of the EQ AMP board can be checked.

Bottom Plate: ❺ to ❼
The conductor side of the POWER AMP board can be checked.

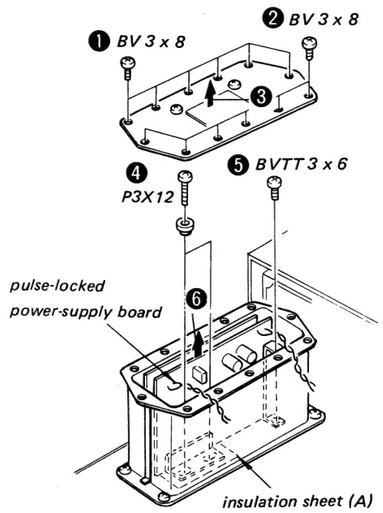


[PANEL ASSEMBLY REMOVAL]

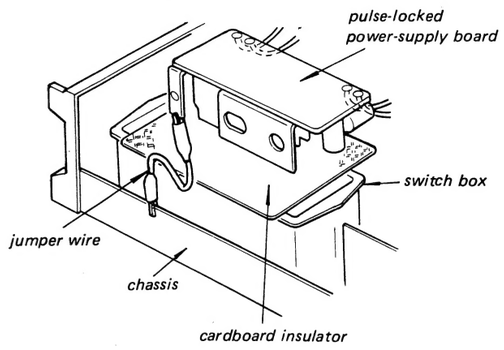
After removing the panel assembly, the S6 (POWER), EQ AMP board and FLAT AMP board can be removed.



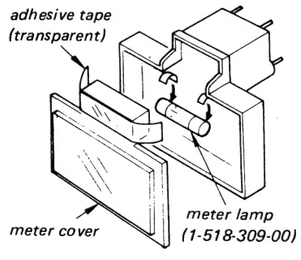
[PULSE-LOCKED POWER-SUPPLY BOARD REMOVAL]



CAUTION
The negative circuit of the secondary rectifier in the pulse-locked power-supply circuit is grounded by screws in the aluminum diecast box. When checking the pulse-locked power-supply board out of the box, use a jumper wire and a cardboard insulator as shown below.



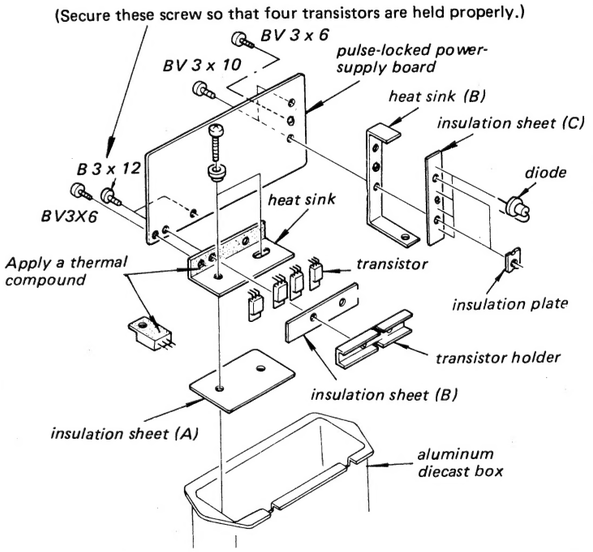
[METER LAMP REPLACEMENT]



Note:
To obtain the same brightness of meter lamps, replace both lamps (L-CH and R-CH) together with new ones.

Exploded view (Refer this when installing the pulse-locked power-supply board.)

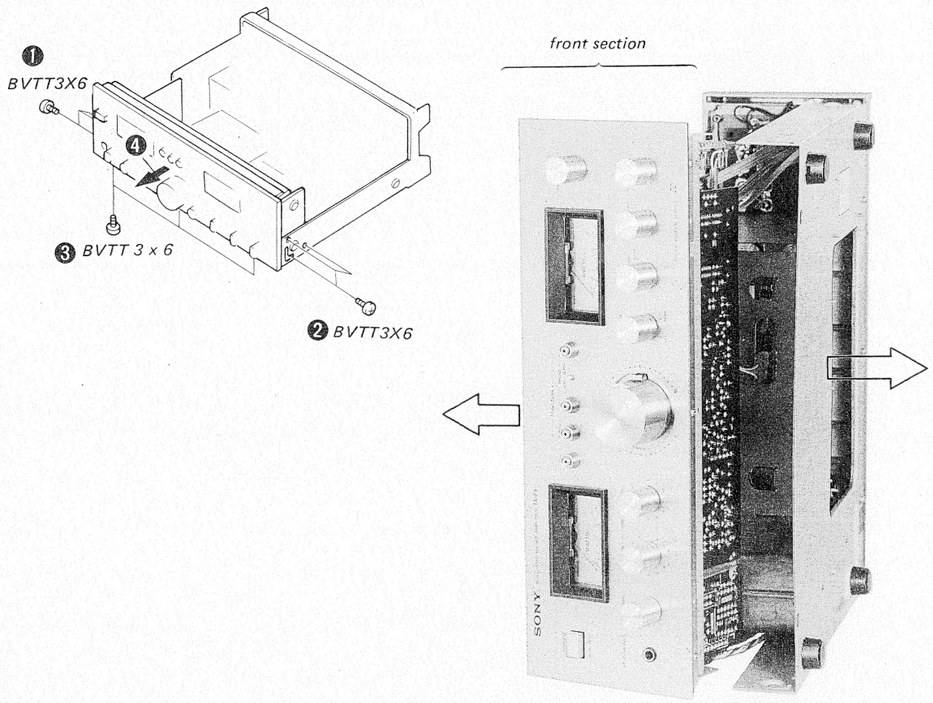
(Secure these screw so that four transistors are held properly.)



Note:
- If a insulation sheet is injured or torn, change it.
- Confirm that there are no scraps of solder or lead wire on any insulation sheet.

[FLAT AMP BOARD CHECKING AND SERVICING]

The FLAT AMP board and EQ AMP board on the front section can be separated from the chassis.



SECTION 3

ELECTRICAL ADJUSTMENTS

Note:

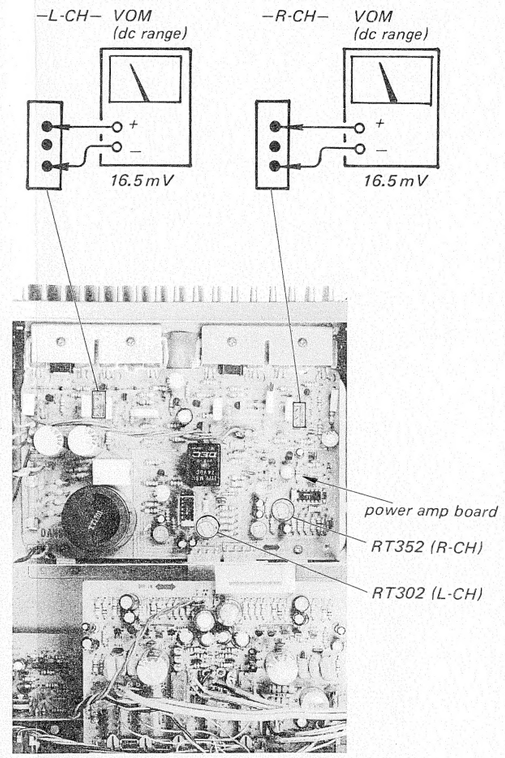
1. DC BIAS and DC BALANCE adjustments should be performed several minutes after the set becomes stable (S6: POWER is set to ON.)
2. Perform first DC BIAS adjustment.
3. Repeat DC BIAS and DC BALANCE adjustments two or three times.
4. After servicing or changing the power transistors, DC BIAS and DC BALANCE adjustments should be performed.

DC Bias Adjustment

Procedure:

Adjust RT302 (L-CH) and RT352 (R-CH) for 16.5 mV readings.

Adjustment Location:



SECTION 3

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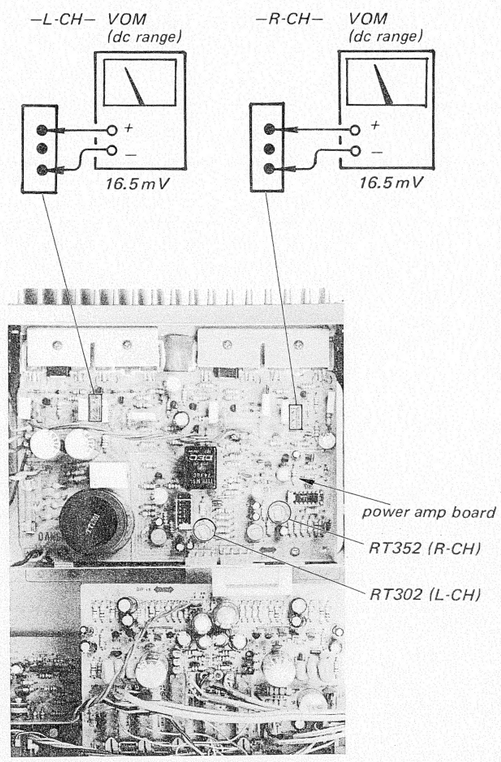
Adjust RT302 (L-CH) and RT352 (R-CH) for 16.5 mV readings.

Adjustment Location:

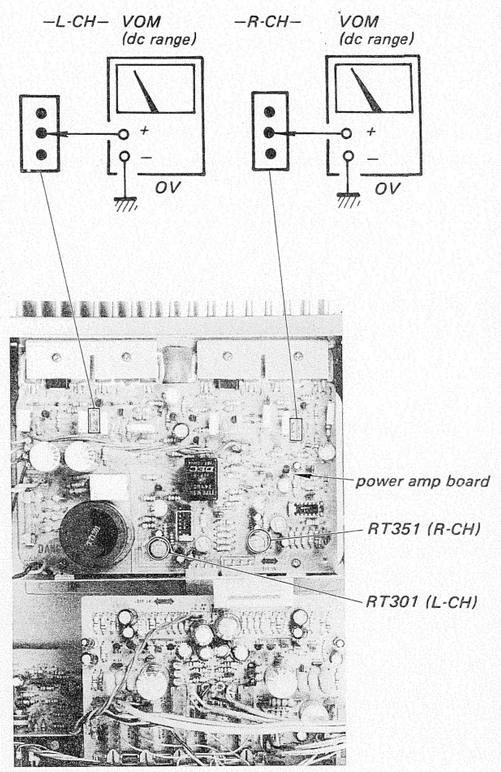


DC Balance Adjustment

Procedure:

Adjust RT301 (L-CH) and RT351 (R-CH) for 0V readings.

Adjustment Location:

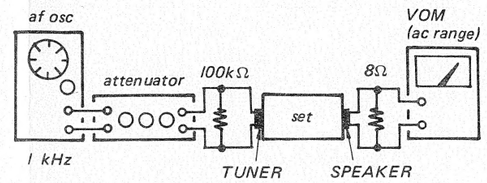


Meter Level Calibration

Setting:

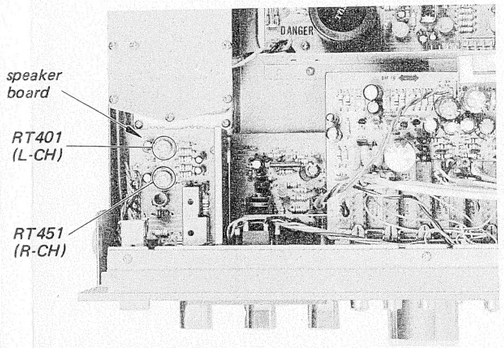
FUNCTION switch: TUNER

Procedure:



1. Turn the VOLUME control fully clockwise.
2. Adjust the TUNER input level for a 2.83 V reading.
3. Adjust RT401 (L-CH) and RT451 (R-CH) so that the power meters indicate 1 W.

Adjustment Location:

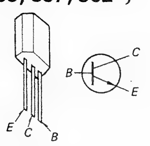


SECTION 4
DIAGRAMS

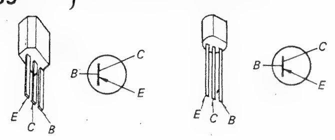
4-1. MOUNTING DIAGRAM
– Power Amplifier Section –

- **Replacement Semiconductors**
  For replacement, use semiconductors except in ( ).

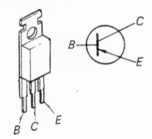
Q301, 306–308
Q310, 311, 351
Q356, 357, 502 : 2SC1364 (2SC1634)



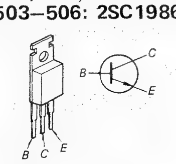
Q302, 352
Q305, 355
Q309 : 2SA678 (2SA733)



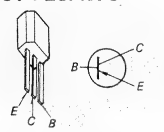
Q303, 312
Q353, 362 : 2SA771



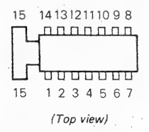
Q304, 354
Q313, 363 : 2SC1986C-O (2SC1986)
Q503–506: 2SC1986C-O (2SC1986D)



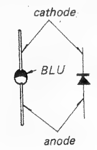
Q501 : 2SA678



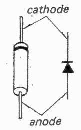
IC301, 351 : CX171



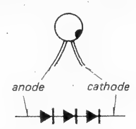
D301, 302
D351, 352 : MV12N



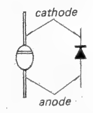
D303, 353
D304, 354 : 1S2076A
D305, 355
D401, 451
D402, 452 : 1T22AM (1T22)
D306, 356
D308, 313, 363
D501, 502 : 1S1555



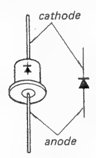
D307 : MV203V



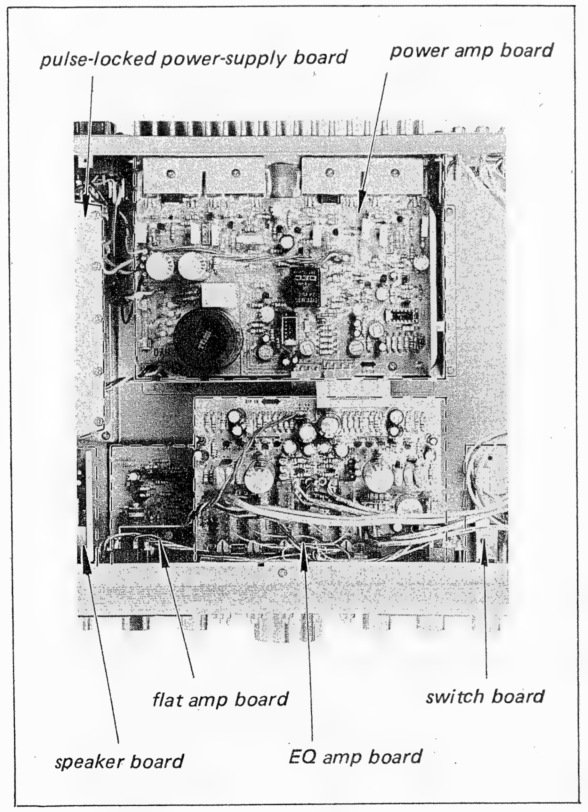
D309–312 : UO5G (UO5E)



D503–506 : S34

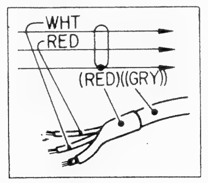


CIRCUIT BOARD LOCATION



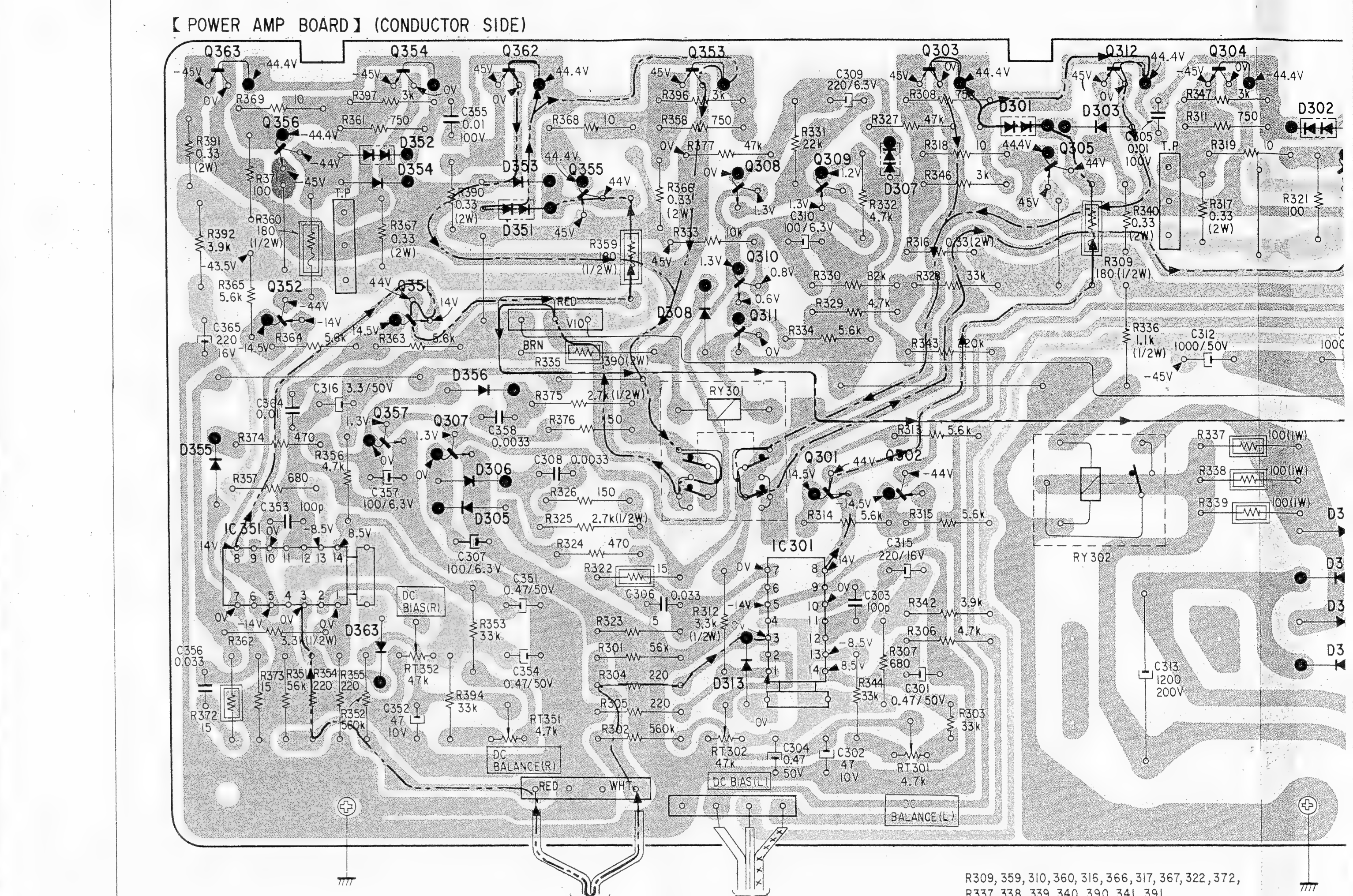
Note:

- The terminals of S7 (SPEAKERS) shown by ※ are not connected to the circuit.
- ○— : parts extracted from the component side.
- Color code of sleeving over the end of the jacket.

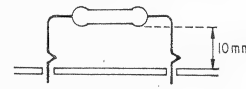


- ▒ : B – pattern
- ▒ : B + pattern
- Readings are taken under no-signal conditions with a VOM (20 kΩ/V).
- Signal Path
  —·—►: L-CH
  —··—►: R-CH
  ——►: common

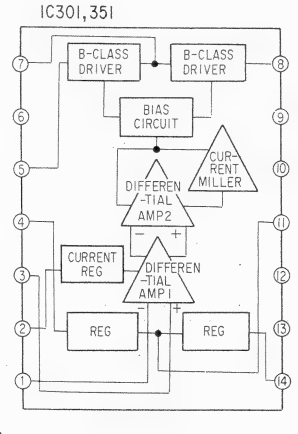
D	355	352 354 363	356 306 305	353 351	308	313	307	301	303	302
Q, IC	363	356 352 IC351	354 357 351 307	362 355	353	308 310 311 IC301	309 301	302 303	305 312	304

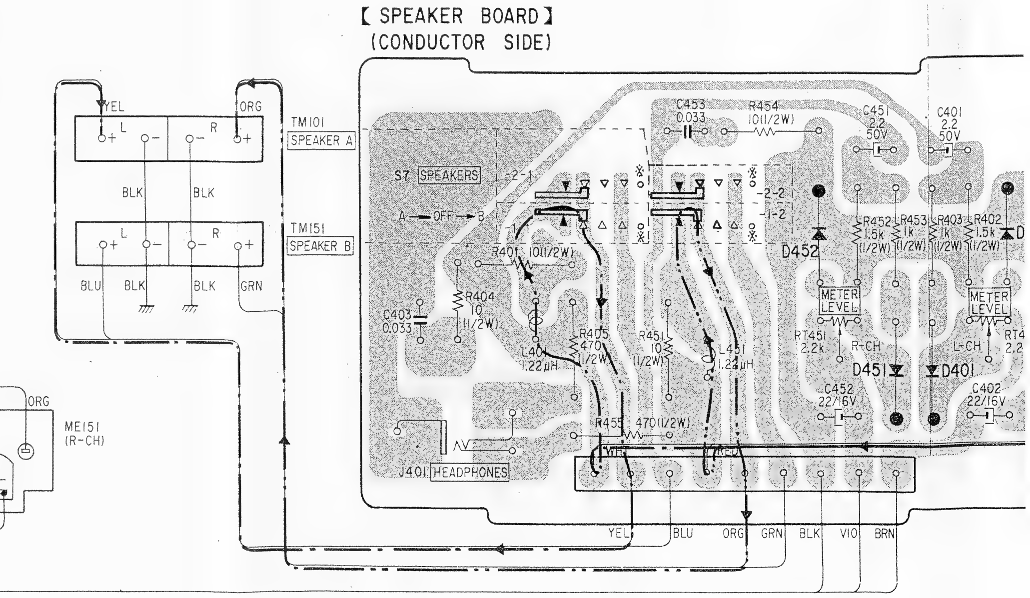


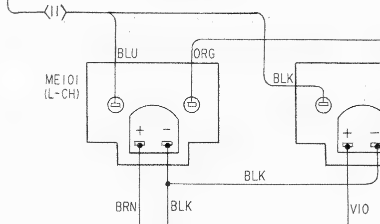
R309, 359, 310, 360, 316, 366, 317, 367, 322, 372,
R337, 338, 339, 340, 390, 341, 391
D309, 310, 311, 312
are mounted as shown below.



IC301, 351







TA-F5

D	355	352 354 363	356 306 305	353 351	308 313	307	301	303	302 311 309 310 312	304	
Q, IC	363	356 352 IC351	354 351 357	307	362	355	353 308 310 311 IC301	309 301	303 302	305 312 304	306 313	Q, IC

【 POWER AMP BOARD 】 (CONDUCTOR SIDE)

【 PULSE-LOCKED POWER-SUPPLY BOARD 】 (CONDUCTOR SIDE)

190Vp-p

55μS

● WITH NO SIGNAL

T504 WINDING

R309, 359, 310, 360, 316, 366, 317, 367, 322, 372,
R337, 338, 339, 340, 390, 341, 391
D309, 310, 311, 312
are mounted as shown below.

10mm

IC301, 351

【 SPEAKER BOARD 】 (CONDUCTOR SIDE)

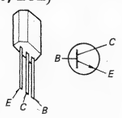
HEAT SINK

Q	D
	503,504 505,506
	50
506	50
502	
501	
505	
503	
504	

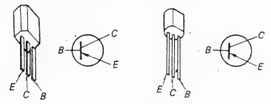
4-2. MOUNTING DIAGRAM
— Preamplifier Section —

- **Replacement Semiconductors**
  For replacement, use semiconductors except in ( ).

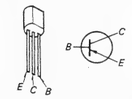
Q101–103, Q151–153, Q107, 157, Q201, 202 : 2SC1637-0 (2SC2129)



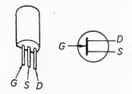
Q105, 155 : 2SA705 (2SA872)
Q208, 209 : 2SA678 (2SA733)



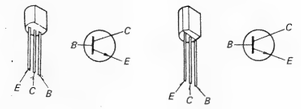
Q106, 156 : 2SA896 (2SB646)



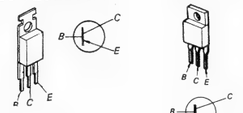
Q108, 158 : 2SK43-4 (2SK43)



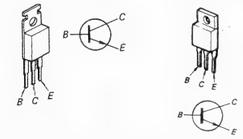
Q109, 159 : 2SC1811 (2SD666)



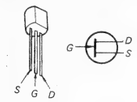
Q203 : 2SB566A (2SA768)



Q204 : 2SD476A (2SC1826)

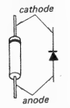


Q205–207 : 2SK30A (2SK30)

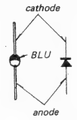


IC201, 251 : HA1457

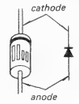
D101, 151 : 1S1555
D205 : 10E2



D102, 152 : MV12N



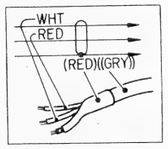
D103 : EQB01-06 (EQA01-06)
D201, 204 : EQB01-30 (EQA01-30R)
D202, 203 : EQB01-25 (EQA01-25R)



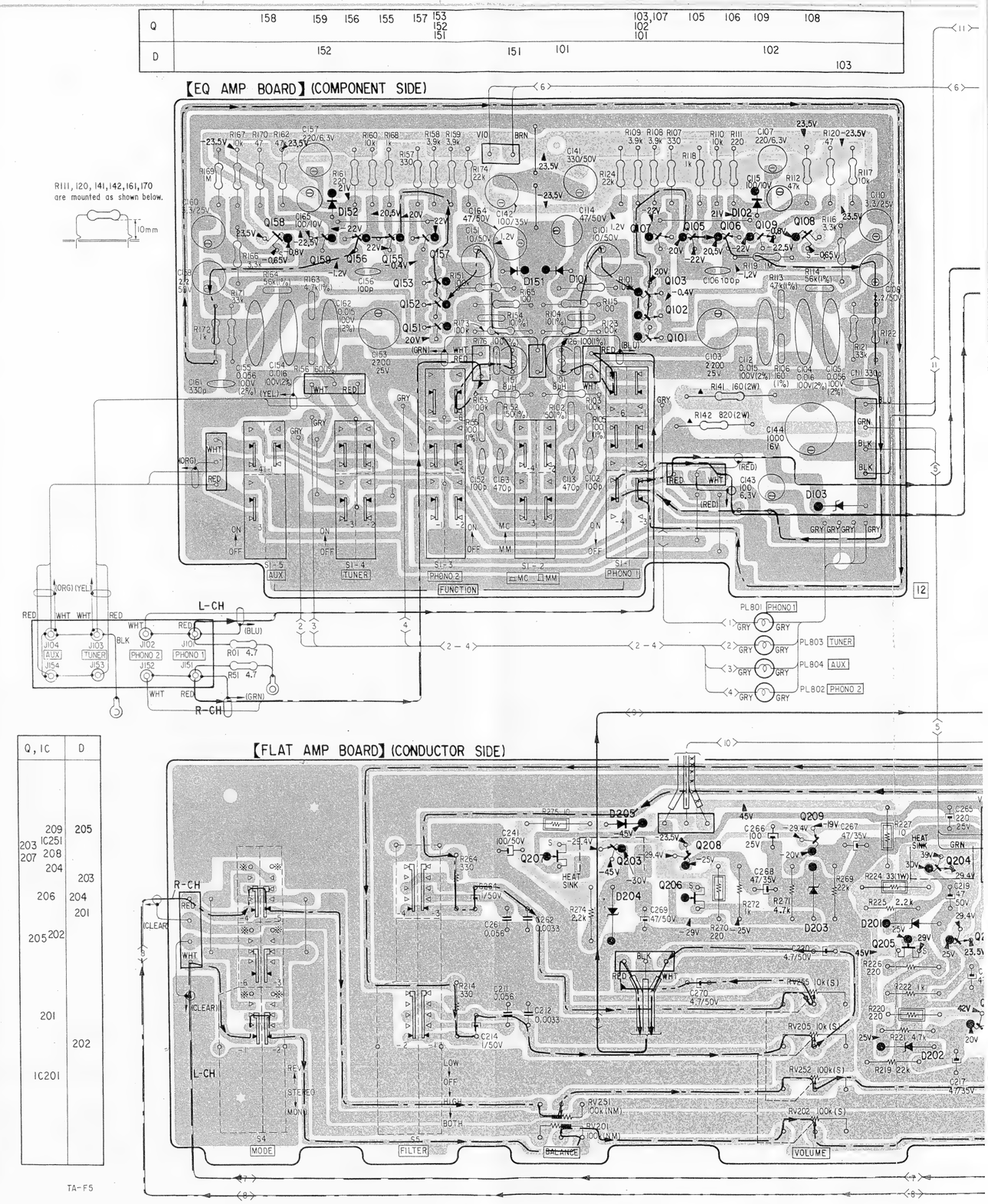
CIRCUIT BOARD LOCATION

Note:

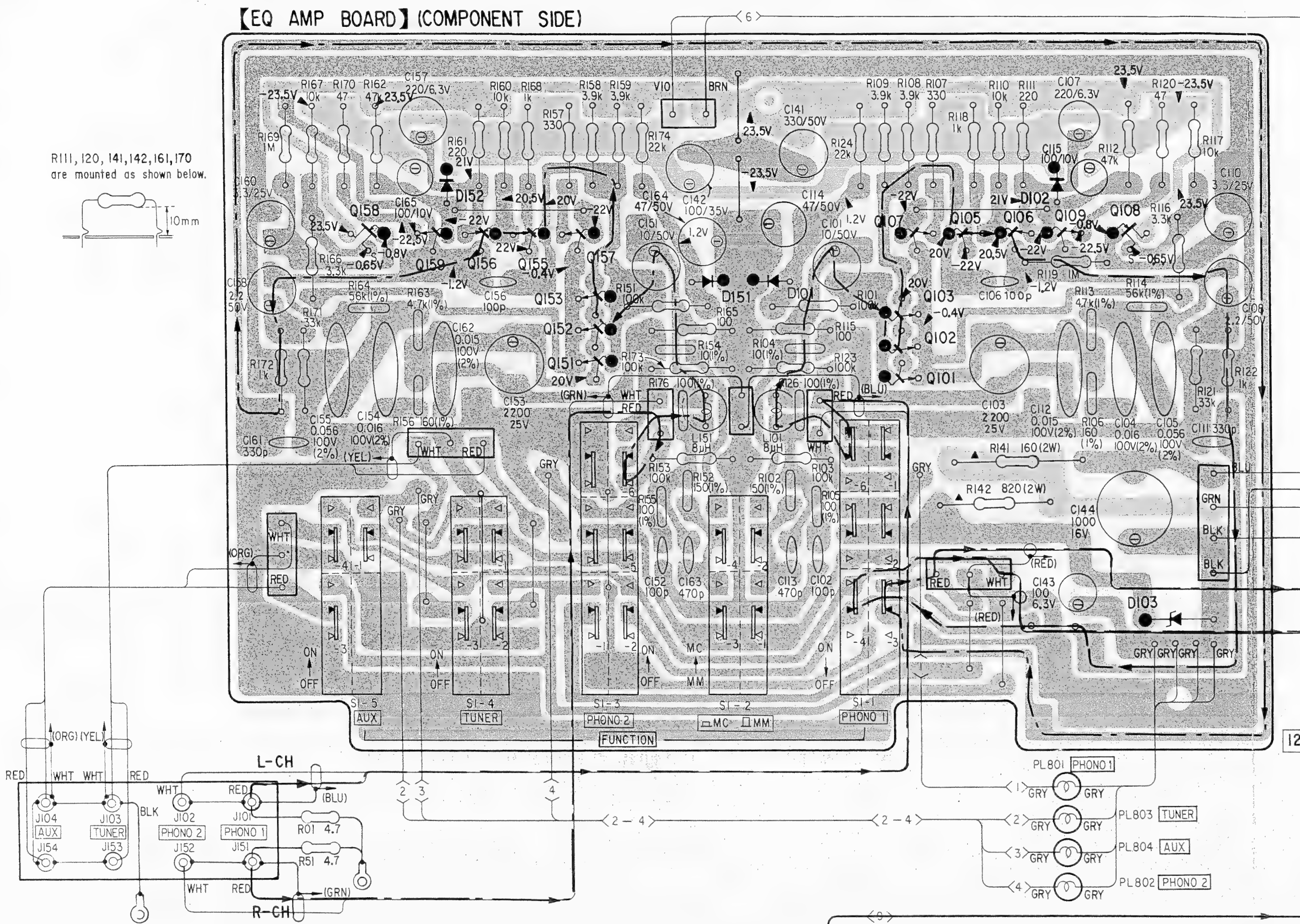
- ▲ : nonflammable resistor
- The terminals of S2 (MONITOR), S3 (TAPE COPY) and S4 (MODE) shown by ※ are not connected to the circuit.
- ○— : parts extracted from the component side.
- Color code of sleeving over the end of the jacket.

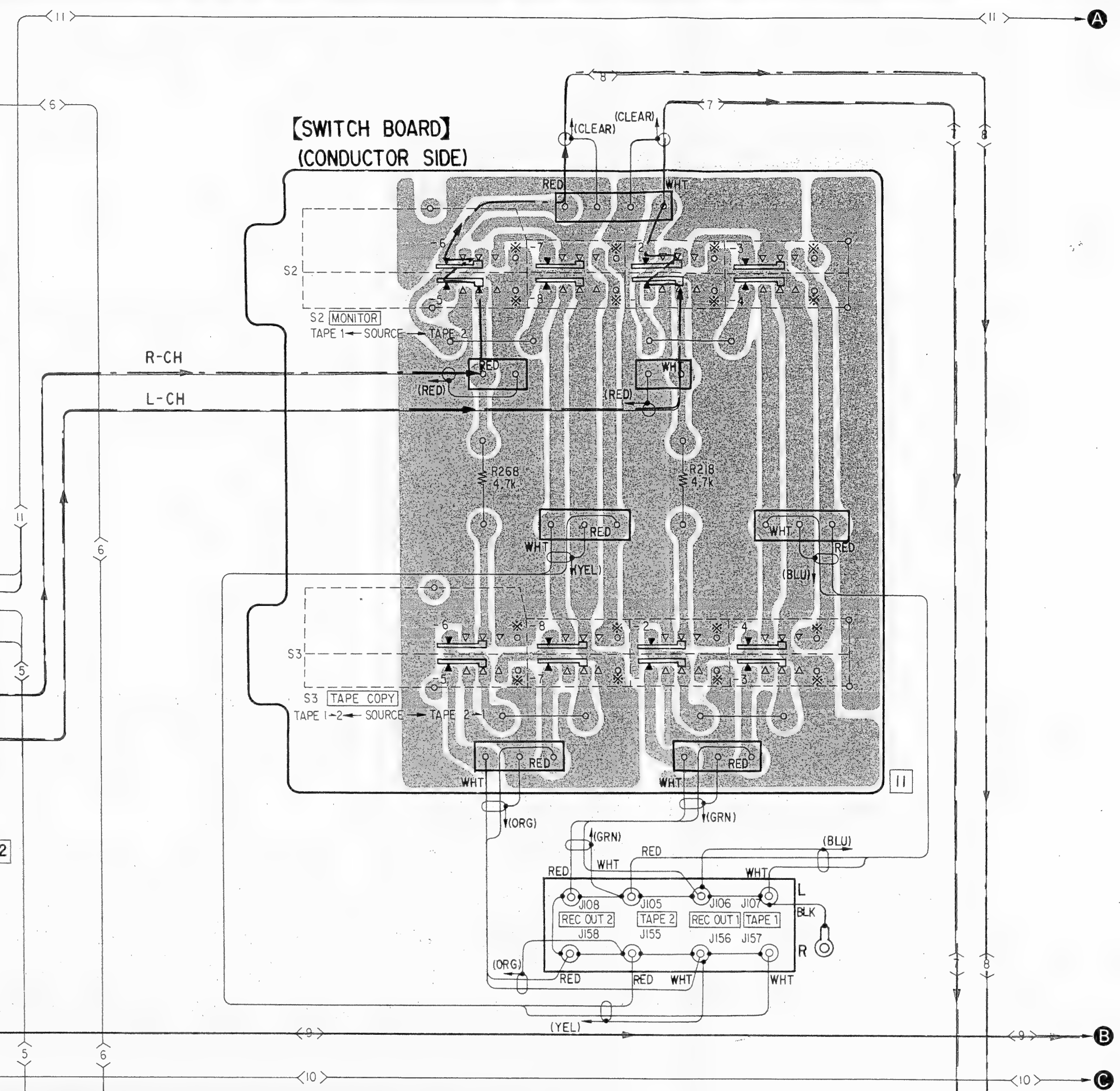


- ▒▒▒ : B — pattern
- ▒▒▒ : B + pattern
- Signal Path
  —·—▶: L-CH
  —··—▶: R-CH
  ——▶: common

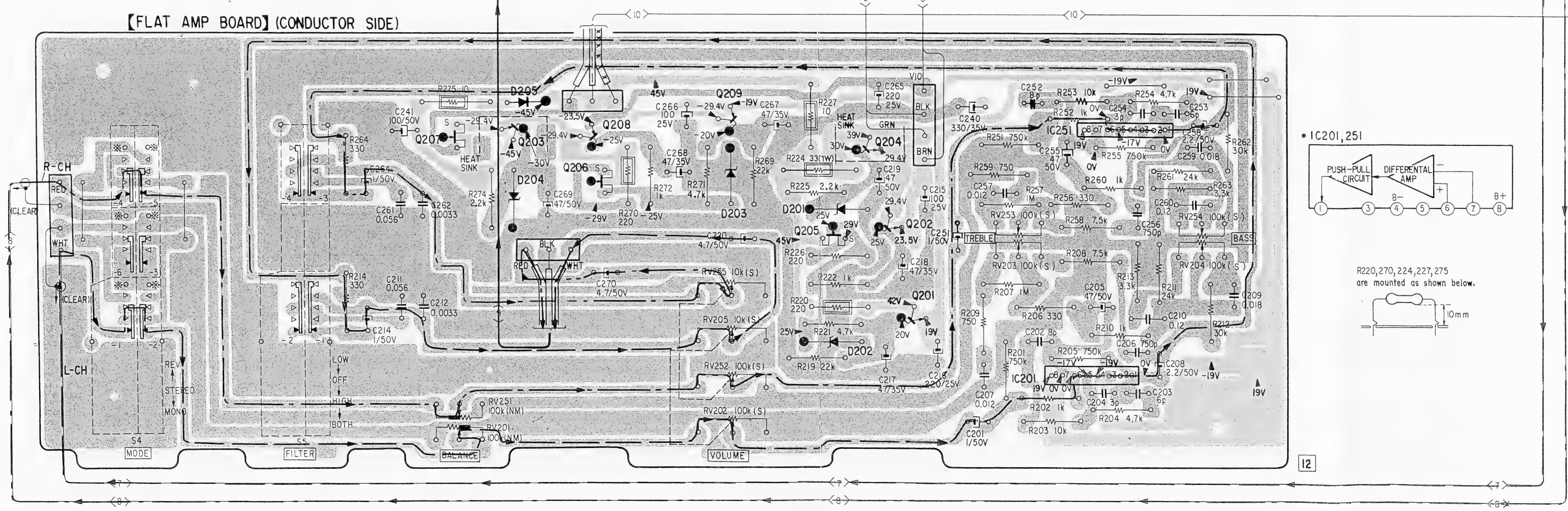


Q	158 159 156 155 157 153 152 151 103,107 102 101 105 106 109 108
D	152 151 101 102 103





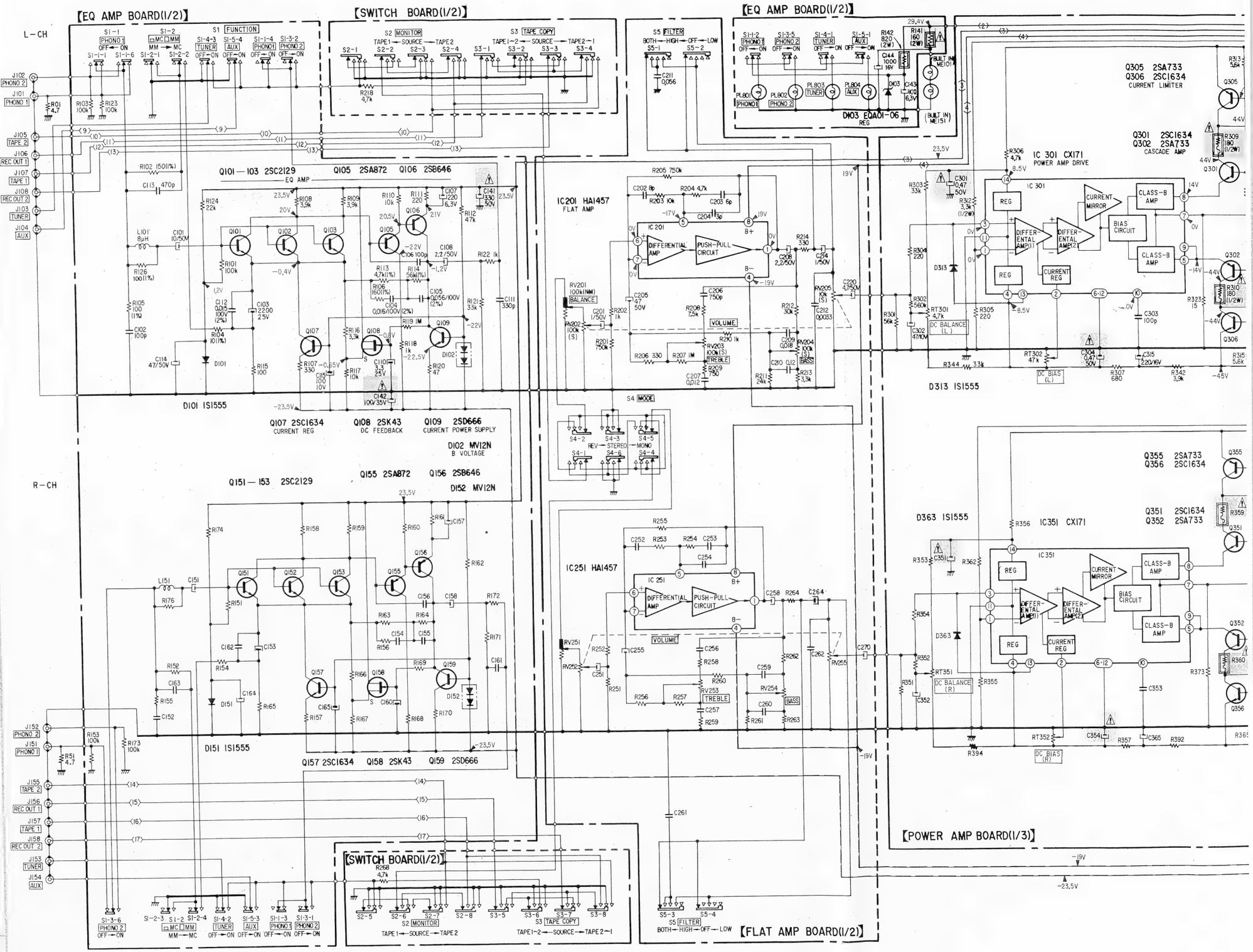
Q, IC	D
209	205
203 IC251 207 208	
204	203
206	204
	201
205 202	
201	
	202
IC201	

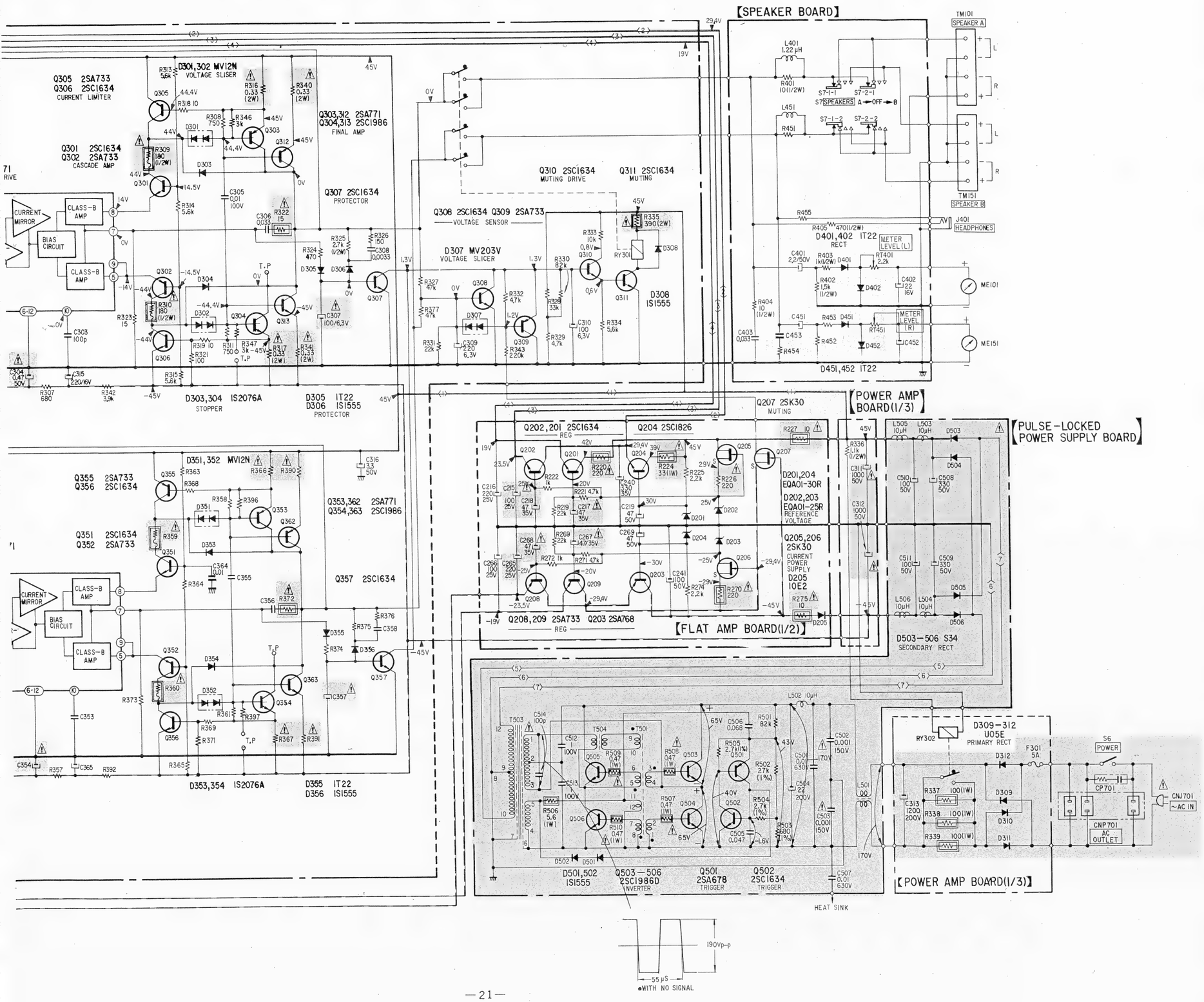


TA-F5

-30R)
-25R)

4-3. SCHEMATIC DIAGRAM





Note:

- Components for right channel have same values as for left channel.
- 1 or 2% indicates component tolerance.
- All capacitors are in μF unless otherwise noted. pF = μμF 50 WV or less are not indicated except for electrolytics.
- All resistors are in ohms, ¼ W unless, otherwise noted kΩ = 1000 Ω; MΩ = 1000 kΩ
- ▭: nonflammable resistor.
- ▭: fusible and nonflammable resistor
- ▭ : adjustment for repair.
- ——— : B+ bus.
- – – – : B– bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.

  Readings are taken under no-signal conditions with a VOM (20 kΩ/V).
- Switch

Ref. No.	Switch	Position
S1-1	PHONO 1	ON
S1-2	MC/MM	MM
S1-3	PHONO 2	OFF
S1-4	TUNER	OFF
S1-5	AUX	OFF
S2	MONITOR	SOURCE
S3	TAPE COPY	SOURCE
S4	MODE	STEREO
S5	FILTER	LOW
S6	POWER	OFF
S7	SPEAKER	A

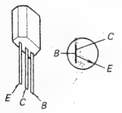
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

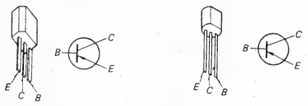
4-4. MOUNTING DIAGRAM
– EQ Amp Board –

- **Replacement Semiconductors**
  For replacement, use semiconductors except in ( ).

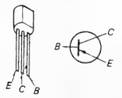
Q101–103, Q151–153: 1SC1637-0 (2SC2129)
Q107, 157: 2SC1364 (2SC1634)



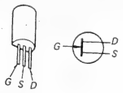
Q105, 155 : 2SA705 **(2SA872)**



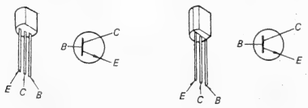
Q106, 156 : 2SA896 (2SB646)



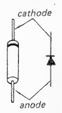
Q108, 158 : 2SK43-4 (2SK43)



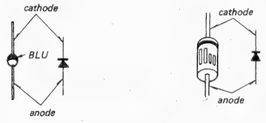
Q109, 159 : 2SC1811 **(2SD666)**



D101, 151 : 1S1555

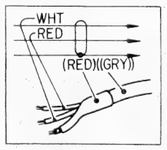


D102, 152 : MV12N **D103 : EQB01-06 (EQA01-06)**



Note:

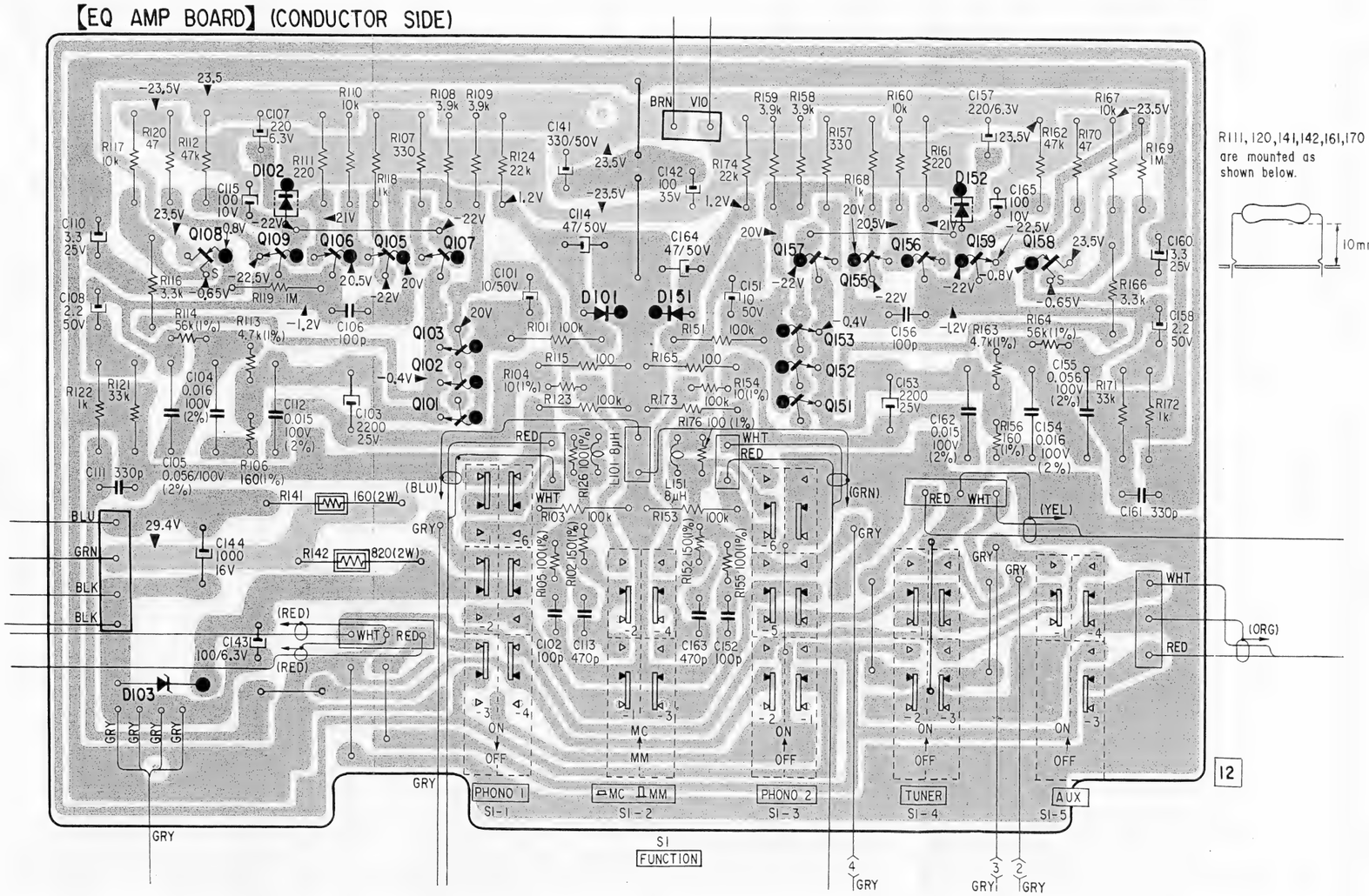
- ○— : parts extracted from the component side.
- Color code of sleeving over the end of the jacket.



- [redacted] : B – pattern
- [redacted] : B + pattern

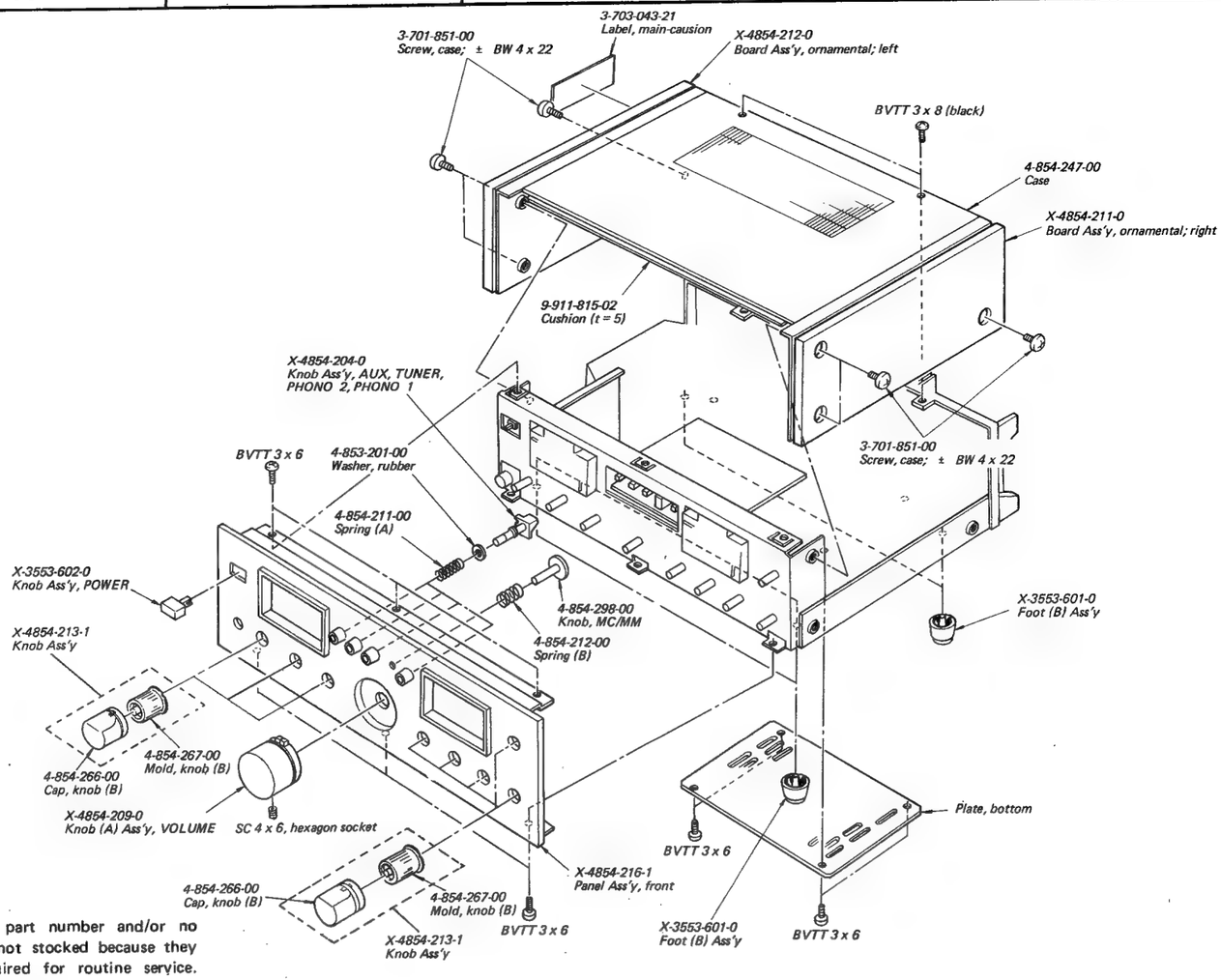
D	103	102				101	151	152				
Q	108	109	106	105	107			157	155	156	159	158
					103			153				
					102			152				
					101			151				

【EQ AMP BOARD】 (CONDUCTOR SIDE)



R111, 120, 141, 142, 161, 170 are mounted as shown below.

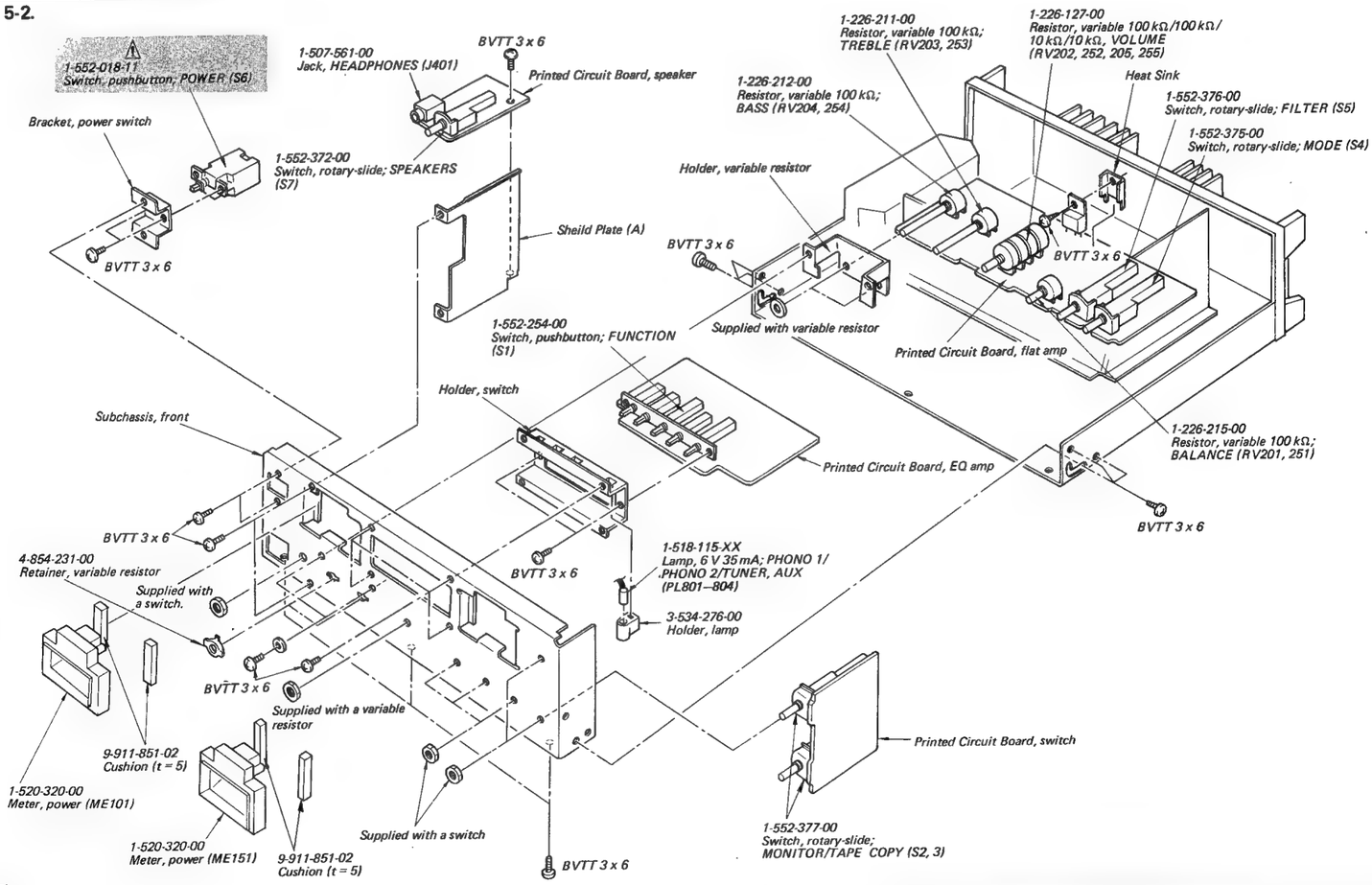
5-1.



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (—) = slotted head

5-2.



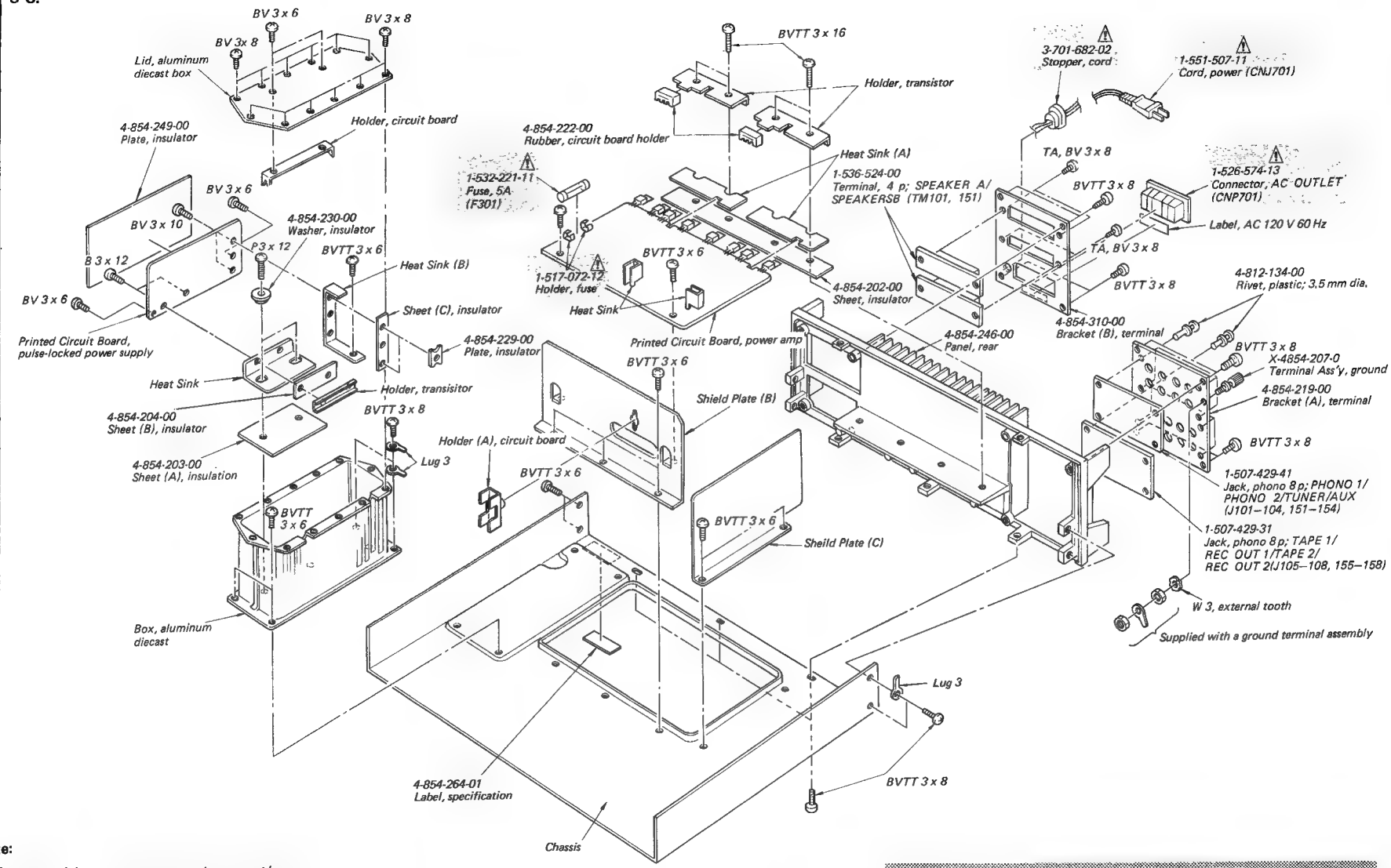
Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (—) = slotted head

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

5-3.



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (—) = slotted head

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SECTION 6

ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
	SEMICONDUCTORS	
	Transistors	
⇒Q101–103, Q151–153	8-761-700-00	2SC1637-0
⇒Q105, 155	8-727-756-06	2SA705
⇒Q106, 156	8-765-082-20	2SA896
⇒Q107, 157	8-729-663-47	2SC1364
⇒Q108, 158	8-723-304-00	2SK43-4
⇒Q109, 159	8-765-012-20	2SC1811
⇒Q201, 202	8-729-663-47	2SC1364
⇒Q203	8-729-306-62	2SB566A
⇒Q204	8-729-307-62	2SD476A
⇒Q205–207	8-729-203-04	2SK30A
⇒Q208, 209	8-727-788-00	2SA678
⇒Q301, 351	8-729-663-47	2SC1364
⇒Q302, 352	8-727-788-00	2SA678
Q303, 353	8-729-377-12	2SA771
⇒Q304, 354	8-729-308-62	2SC1986C-O
⇒Q305, 355	8-727-788-00	2SA678
⇒Q306, 356, Q307, 357	8-729-663-47	2SC1364
⇒Q308	8-729-663-47	2SC1364
⇒Q309	8-727-788-00	2SA678
⇒Q310, 311	8-729-663-47	2SC1364
Q312, 362	8-729-377-12	2SA771
⇒Q313, 363	8-729-308-62	2SC1986C-O
Q501	⚠8-727-788-00	2SA678
⇒Q502	⚠8-729-663-47	2SC1364
⇒Q503–506	⚠8-729-308-62	2SC1986C-O
	ICs	
IC201, 251	8-759-314-57	HA1457
IC301, 351	8-751-710-00	CX171
	Diodes	
D101, 151	8-719-815-55	1S1555
D102, 152	8-719-912-00	MV12N
⇒D103	8-719-931-06	EQB01-06
⇒D201	8-719-931-30	EQB01-30
⇒D202, 203	8-719-931-25	EQB01-25
⇒D204	8-719-931-30	EQB01-30
D205	8-719-200-02	10E2
D301, 302, D351, 352	8-719-912-00	MV12N
D303, 304, D353, 354	8-719-923-76	1S2076A
⇒D305, 355	8-719-422-31	1T22AM
D306, 356	8-719-815-55	1S1555
D307	8-719-920-30	MV203 V
D308	8-719-815-55	1S1555
⇒D309–312	⚠8-719-911-55	U05G
D313, 363	8-719-815-55	1S1555
⇒D401, 402, D451, 452	8-719-422-21	1T22AM
D501, 502	⚠8-719-815-55	1S1555
D503–506	⚠8-719-303-41	S34
	COILS	
L101, 151	1-407-519-11	8 μH, microinductor
L401, 451	1-420-838-00	1.22 μH
L501	⚠1-421-328-00	Line Filter
L502–506	⚠1-421-329-00	10 μH, choke
	TRANSFORMERS	
T501	⚠1-433-197-00	Osc
T503	⚠1-466-090-00	Convertor
T504	⚠1-543-129-00	Core

CAPACITORS

All capacitors are in μF and ceramic unless otherwise noted.
50 WV or less are not indicated except for electrolytics.
pF : μμF, elect : electrolytic

C101. 151	1-121-738-11	10	50 V	elect
C102, 152	1-102-973-11	100 p		
C103, 153	1-123-067-11	2200	25 V	elect
C104, 154	1-130-125-11	0.016	100 V	polyethylene
C105, 155	1-130-126-11	0.056	100 V	polyethylene
C106, 156	1-102-973-11	100 p		

⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description		
C107, 157	1-121-419-11	220	6.3 V	elect
C108, 158	1-121-450-11	2.2	50 V	elect
C110, 160	1-121-392-11	3.3	25 V	elect
C111, 161	1-102-820-11	330 p		
C112, 162	1-130-124-11	0.015	100 V	polyethylene
C113, 163	1-102-114-11	470 p		composition
C114, 164	1-123-058-11	47	50 V	elect
C115, 165	1-121-414-11	100	10 V	elect
C141	⚠1-123-060-11	330	50 V	elect
C142	⚠1-121-357-11	100	35 V	elect
C143	1-121-414-11	100	6.3 V	elect
C144	1-121-944-11	1000	16 V	elect
C201, 251	1-121-391-11	1	50 V	elect
C202, 252	1-102-945-11	8 p		
C203, 253	1-102-943-11	6 p		
C204, 254	1-102-936-11	3 p		
C205, 255	1-123-058-11	47	50 V	elect
C206, 256	1-104-074-11	750 p		
C207, 257	1-108-372-12	0.012		mylar
C208, 258	1-121-450-11	2.2	50 V	elect
C209, 259	1-108-358-12	0.018		mylar
C210, 260	1-108-363-12	0.12		mylar
C211, 261	1-108-361-12	0.056		mylar
C212, 262	1-108-232-12	0.0033		mylar
C214, 264	1-121-391-11	1	50 V	elect
C215	⚠1-121-935-11	100	25 V	elect
C265	⚠1-121-936-11	220	25 V	elect
C216	1-121-936-11	220	25 V	elect
C266	1-121-935-11	100	25 V	elect
C217, 267 C218, 268	⚠1-123-186-11	47	35 V	elect
C219, 269	1-123-058-11	47	50 V	elect
C220, 270	1-121-750-11	4.7	50 V	elect
C240	1-123-060-11	330	35 V	elect
C241	1-123-059-11	100	50 V	elect
C301, 351	⚠1-121-726-11	0.47	50 V	elect
C302, 352	1-121-409-11	47	10 V	elect
C303, 353	1-102-973-11	100 p		

Ref. No.	Part No.	Description		
C304, 354	⚠1-121-726-11	0.47	50 V	elect
C305, 355	1-108-377-12	0.01	100 V	mylar
C306, 356	1-108-244-12	0.033		mylar
C307, 357	⚠1-123-196-11	100	6.3 V	elect
C308, 358	1-108-232-12	0.0033		mylar
C309	1-121-419-11	220	6.3 V	elect
C310	1-121-414-11	100	6.3 V	elect
C311, 312	⚠1-123-061-11	1000	50 V	elect
C313	⚠1-125-180-11	1200	200 V	elect
C314, 364	1-108-239-12	0.01	50 V	mylar
C315, 365	1-123-068-11	220	16 V	elect
C316	1-121-393-11	3.3	50 V	elect
C401, 451	1-121-450-11	2.2	50 V	elect
C402, 452	1-121-479-11	22	16 V	elect
C403, 453	1-108-244-12	0.033		mylar
C501	⚠1-130-141-11	0.01	630 V	polyethylene
C502, 503	⚠1-102-191-11	0.001	150 V	
C504	⚠1-125-176-11	22	200 V	elect
C505	⚠1-108-246-12	0.047		mylar
C506	⚠1-108-599-12	0.068		mylar
C507	⚠1-130-141-11	0.01	630 V	polyethylene
C508, 509	⚠1-123-060-11	330	50 V	elect
C510, 511	⚠1-123-059-11	100	50 V	elect
C512, 513	⚠1-130-083-11	1	100 V	polyethylene
C514	⚠1-102-973-11	100 p		

RESISTORS

All resistors are in ohms. Common ¼ W carbon resistors are omitted. Refer to the list on page 31 for their resistance values. (k = 1000, M = 1000 k)

R102, 152	1-214-112-11	150		metal oxide
R104, 154	1-214-084-11	10		metal oxide
R105, 155	1-214-108-11	100		metal oxide
R106, 156	1-214-113-11	160		metal oxide
R113, 163	1-214-148-11	4.7 k		metal oxide
R114, 164	1-214-174-11	56 k		metal oxide
R126, 176	1-214-108-11	100		metal oxide
R141	⚠1-206-645-11	160	2 W	metal oxide (nonflammable)

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description		
R142	1-206-662-11	820	2 W	metal oxide (nonflammable)
R220, 270	⚠1-211-530-11	220		carbon (nonflammable)
R224	⚠1-213-125-11	33	1 W	metal oxide (nonflammable)
R226	⚠1-244-657-11	220		carbon
R227, 275	⚠1-211-498-11	10		carbon (nonflammable)
R309, 359 R310, 360	⚠1-212-988-11	180	½ W	fusible (nonflammable)
R312, 362	1-244-885-11	3.3 k	½ W	
R316, 366 R317, 367	⚠1-217-152-11	0.33	2 W	
R322, 372	⚠1-211-502-11	15		carbon (nonflammable)
R325, 375	1-244-883-11	2.7 k	½ W	
R335	⚠1-206-654-11	390	2 W	metal oxide (nonflammable)
R336	1-244-874-11	1.1 k	½ W	
R337–339	⚠1-214-131-11	100	1 W	metal oxide (nonflammable)
R340, 390 R341, 391	⚠1-217-152-11	0.33	2 W	
R401, 451	1-244-825-11	10	½ W	
R402, 452	1-244-877-11	1.5 k	½ W	
R403, 453	1-244-873-11	1 k	½ W	
R404, 454	1-244,825-11	10	½ W	
R405, 455	1-244-865-11	470	½ W	
R501	⚠1-244-719-11	82 k		carbon
R502	⚠1-214-166-11	27 k	(1%)	metal oxide
R503	⚠1-214-128-11	680	(1%)	metal oxide
R504, 505	⚠1-214-142-11	2.7 k	(1%)	metal oxide
R506	⚠1-212-369-11	5.6	1 W	metal oxide (nonflammable)
R507–510	⚠1-212-356-11	0.47	1 W	metal oxide (nonflammable)

All variable and adjustable resistors have characteristic curve B, unless otherwise noted. (k : 1000)

RT301, 351	1-224-251-XX	4.7 k, adjustable; dc balance
RT302, 352	1-224-254-XX	47 k, adjustable; dc bias
RT401, 451	1-224-250-XX	2.2 k, adjustable; meter level
RV201, 251	1-226-215-00	100 k, variable; BALANCE
RV202, 252 RV205, 255	1-226-127-00	100 k/100 k/10 k/10 k, variable; VOLUME
RV203, 253	1-226-211-00	100 k, variable; TREBLE
RV204, 254	1-226-212-00	100 k, variable; BASS

SWITCHES

S1	1-552-254-00	Pushbutton, FUNCTION
S2, 3	1-552-377-00	Rotary-slide, MONITOR/ TAPE COPY
S4	1-552-375-00	Rotary-slide, MODE
S5	1-552-376-00	Rotary-slide, FILTER
S6	⚠1-552-018-11	Pushbutton, POWER
S7	1-552-372-00	Rotary-slide, SPEAKERS

JACKS

J101–104 J151–154	1-507-429-41	Phono, 8 p; PHONO 1/PHONO 2/ TUNER/AUX
J105–108 J155–158	1-507-429-31	Phono, 8 p; TAPE 1/REC OUT 1/ TAPE 2/REC OUT 2
J401	1-507-561-00	HEADPHONES

MISCELLANEOUS

CNJ701	⚠1-551-507-11	Cord, power
CNP701	⚠1-526-574-13	Connector, AC OUTLET
CP701	⚠1-231-345-11	Encapuslated Component
F301	⚠1-532-221-11	Fuse, 5A
ME101, 151	1-520-320-00	Meter, POWER
PL801–804	1-518-115-XX	Lamp, 6 V 35 mA; PHONO 1/ PHONO 2/TUNER/AUX
RY301	1-515-302-11	Relay
RY302	1-515-278-22	Relay
TM101, 151	1-536-524-00	Terminal, 4 p; SPEAKER A/ SPEAKER B
	⚠1-517-072-12	Holder, fuse

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ACCESSORIES & PACKING MATERIALS

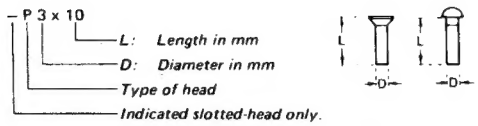
Part No.	*Description*
1-506-113-11	Plug, shorting
3-701-020-00	Bag, plastic
3-701-622-00	Bag, plastic
3-770-456-31	Manual, instruction
4-809-251-00	Bag
4-854-273-00	Cushion
4-854-275-00	Carton

1/4 WATT CARBON RESISTORS

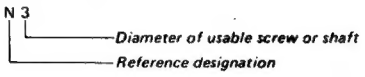
Ω	*Part No.*	Ω	*Part No.*	Ω	*Part No.*	Ω	*Part No.*	Ω	*Part No.*	Ω	*Part No.*	Ω	*Part No.*
1.0	1-244-601-11	10	1-244-625-11	100	1-244-649-11	1.0k	1-244-673-11	10 k	1-244-697-11	100k	1-244-721-11	1.0M	1-244-745-11
1.1	1-244-602-11	11	1-244-626-11	110	1-244-650-11	1.1k	1-244-674-11	11 k	1-244-698-11	110k	1-244-722-11	1.1M	1-244-746-11
1.2	1-244-603-11	12	1-244-627-11	120	1-244-651-11	1.2k	1-244-675-11	12 k	1-244-699-11	120k	1-244-723-11	1.2M	1-244-747-11
1.3	1-244-604-11	13	1-244-628-11	130	1-244-652-11	1.3k	1-244-676-11	13 k	1-244-700-11	130k	1-244-724-11	1.3M	1-244-748-11
1.5	1-244-605-11	15	1-244-629-11	150	1-244-653-11	1.5k	1-244-677-11	15 k	1-244-701-11	150k	1-244-725-11	1.5M	1-244-749-11
1.6	1-244-606-11	16	1-244-630-11	160	1-244-654-11	1.6k	1-244-678-11	16 k	1-244-702-11	160k	1-244-726-11	1.6M	1-244-750-11
1.8	1-244-607-11	18	1-244-631-11	180	1-244-655-11	1.8k	1-244-679-11	18 k	1-244-703-11	180k	1-244-737-11	1.8M	1-244-751-11
2.0	1-244-608-11	20	1-244-632-11	200	1-244-656-11	2.0k	1-244-680-11	20 k	1-244-704-11	200k	1-244-728-11	2.0M	1-244-752-11
2.2	1-244-609-11	22	1-244-633-11	220	1-244-657-11	2.2k	1-244-681-11	22 k	1-244-705-11	220k	1-244-729-11	2.2M	1-244-753-11
2.4	1-244-610-11	24	1-244-634-11	240	1-244-658-11	2.4k	1-244-682-11	24 k	1-244-706-11	240k	1-244-730-11	2.4M	1-244-754-11
2.7	1-244-611-11	27	1-244-635-11	270	1-244-659-11	2.7k	1-244-683-11	27 k	1-244-707-11	270k	1-244-731-11	2.7M	1-244-755-11
3.0	1-244-612-11	30	1-244-636-11	300	1-244-660-11	3.0k	1-244-684-11	30 k	1-244-708-11	300k	1-244-732-11	3.0M	1-244-756-11
3.3	1-244-613-11	33	1-244-637-11	330	1-244-661-11	3.3k	1-244-685-11	33 k	1-244-709-11	330k	1-244-733-11	3.3M	1-244-757-11
3.6	1-244-614-11	36	1-244-638-11	360	1-244-662-11	3.6k	1-244-686-11	36 k	1-244-710-11	360k	1-244-734-11	3.6M	1-244-758-11
3.9	1-244-615-11	39	1-244-639-11	390	1-244-663-11	3.9k	1-244-687-11	39 k	1-244-711-11	390k	1-244-735-11	3.9M	1-244-759-11
4.3	1-244-616-11	43	1-244-640-11	430	1-244-664-11	4.3k	1-244-688-11	43 k	1-244-712-11	430k	1-244-736-11	4.3M	1-244-760-11
4.7	1-244-617-11	47	1-244-641-11	470	1-244-665-11	4.7k	1-244-689-11	47 k	1-244-713-11	470k	1-244-737-11	4.7M	1-244-761-11
5.1	1-244-618-11	51	1-244-642-11	510	1-244-666-11	5.1k	1-244-690-11	51 k	1-244-714-11	510k	1-244-738-11	5.1M	1-244-762-11
5.6	1-244-619-11	56	1-244-643-11	560	1-244-667-11	5.6k	1-244-691-11	56 k	1-244-715-11	560k	1-244-739-11		
6.2	1-244-620-11	62	1-244-644 11	620	1-244-668-11	6.2k	1-244-692-11	62 k	1-244-716-11	620k	1-244-740-11		
6.8	1-244-621-11	68	1-244-645-11	680	1-244-669-11	6.8k	1-244-693-11	68 k	1-244-717-11	680k	1-244-741-11		
7.5	1-244-622-11	75	1-244-646-11	750	1-244-670-11	7.5k	1-244-694-11	75 k	1-244-718-11	750k	1-244-742-11		
8.2	1-244-623-11	82	1-244-647-11	820	1-244-671-11	8.2k	1-244-695-11	82 k	1-244-719-11	820k	1-244-743-11		
9.1	1-244-624-11	91	1-244-648-11	910	1-244-672-11	9.1k	1-244-696-11	91 k	1-244-720-11	910k	1-244-744-11		

HARDWARE NOMENCLATURE

Screw:



Nut, Washer, Retaining ring:



Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		brazier-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	

9-958-430-11

Sony Corporation

78H0513-1
Printed in Japan